U.S. Environmental Protection Agency Portion of the Resource Conservation & Recovery Act Permit Pursuant to the Hazardous & Solid Waste Amendments

Safety-Kleen Corporation
EPA I.D. Number: MSD 000 776 765

OWNER:	Safety-Kleen Corporation	OPERATOR:	Safety-Kleen Corporation
	120 Richardson Drive		120 Richardson Drive
	Jackson, Mississippi 39209		Jackson, Mississippi 39209

Pursuant to the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) of 1976, 42 USC Section 6901 et seq., and the Hazardous and Solid Waste Amendments (HSWA) of 1984, P.L. 98-616, and regulations promulgated thereunder by the U.S. Environmental Protection Agency (EPA) (codified and to be codified in Title 40 of the Code of Federal Regulations), a Permit is issued to Safety-Kleen Corporation (hereafter called the Permittee), who owns and operates a hazardous waste facility located in Jackson, MS at latitude 32°21'15" North and longitude 90°15'24" West.

This Permit, in conjunction with the Hazardous Waste Management Permit issued by the State of Mississippi, constitutes the full RCRA Permit for this facility. The Permittee, pursuant to this Permit, shall be required to investigate any releases of hazardous waste or hazardous constituents at the facility regardless of the time at which waste was placed in a unit, and to take appropriate corrective action for any such releases. The Permit also requires the Permittee to comply with all RCRA regulations applicable to this facility.

The Permittee must comply with all terms and conditions of this Permit. This Permit consists of the conditions contained herein (including those in any appendices) and applicable regulations contained in 40 CFR Parts 260 through 264, 266, 268, 270, and 124 as specified in the Permit and statutory requirements of RCRA, as amended by HSWA. Nothing in this Permit shall preclude the Regional Administrator from reviewing and modifying the Permit at any time during its term in accordance with 40 CFR § 270.41.

This Permit is based on the premise that information and reports submitted by the Permittee prior to issuance of this Permit are complete and accurate. Any inaccuracies found in this information or information submitted as required by this Permit may be grounds for termination or modification of this Permit in accordance with 40 CFR § 270.41, § 270.42, and § 270.43 and potential enforcement action. The Permittee must inform EPA of any deviation from or changes in the information in the application which would affect the Permittee's ability to comply with the applicable regulations or Permit conditions.

This Permit is effective SEP 25 2012, and shall remain in effect for ten (10) years until 9/25/2022, unless revoked and reissued, or terminated under 40 CFR § 270.41 and § 270.43 or continued in accordance with 40 CFR § 270.51(a). All obligations for performance of HSWA provisions required under this Permit are in effect until deemed complete by the Regional Administrator.

If any conditions of this Permit are appealed in accordance with 40 CFR § 124.19, the effective date of the conditions determined to be stayed in accordance with 40 CFR § 124.16 shall be determined by final agency action as specified under 40 CFR § 124.19.

9/25/2012
Issued Date

G. Alan Farmer
Director
RCRA Division

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PART I - STANDARD CONDITIONS

I.A. EFFECT OF PERMIT

(40 CFR § 270.4 and § 270.30(g))

Pursuant to 40 CFR § 264.10, the requirements of this Resource Conservation and Recovery Act (RCRA) Permit extend to all contiguous property under the control of the Permittee. A Facility layout diagram is incorporated as Figure 1 (Facility Map) in Appendix A, which demarks the property boundaries under the Permittee's control. Figure 2 (Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) Location Map) in Appendix A illustrates the locations of the SWMUs and AOCs at this facility. Subject to 40 CFR § 270.4, compliance with this RCRA Permit constitutes compliance, for purposes of enforcement, with Subtitle C of RCRA. Issuance of this Permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Compliance with the terms of this Permit does not constitute a defense to any order issued or any action brought under Sections 3008(a), 3008(h), 3004(v), 3008(c), 3007, 3013 or 7003 of RCRA; Sections 104, 106(a), or 107 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. § 9601 et seq., commonly known as CERCLA); or any other law providing for protection of public health or the environment.

I.B. PERMIT ACTIONS

(40 CFR § 124.5, § 270.4(a), § 270.30(f), § 270.41, § 270.42 and § 270.43)

This Permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR § 270.41, § 270.42, and § 270.43 except for the Corrective Action Schedule of Compliance which shall be modified in accordance with Condition II.K. of this Permit. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any Permit condition.

I.C. STAYS OF CONTESTED PERMIT CONDITIONS (SEVERABILITY)

(40 CFR § 124.16)

As specified in 40 CFR § 124.16, if there is a request for review of this Permit, the contested Permit conditions shall be stayed. Uncontested conditions which are not severable from those contested shall also be stayed together with the contested conditions. All other conditions of the Permit become fully effective and enforceable thirty (30) calendar days after the Regional Administrator notifies the Environmental Appeals Board, the Permittee and all other interested parties of this Permit's uncontested (and severable) conditions.

I.D. DUTIES AND REQUIREMENTS

I.D.1. Duty to Comply
(40 CFR § 270.30(a))

The Permittee shall comply with all conditions of this Permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit. Any Permit noncompliance, other than noncompliance authorized by an emergency permit, constitutes a violation of RCRA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or denial of a permit renewal application.

I.D.2. Duty to Reapply
(40 CFR § 270.10(h) and § 270.30(b))

If the Permittee will continue an activity allowed or required by this Permit, after the expiration date of this Permit, the Permittee shall submit a complete application for permit renewal, per 40 CFR § 270.30(b), at least one hundred eighty (180) calendar days before this Permit expires, unless permission for a later date has been granted by the Regional Administrator.

I.D.3. Obligation for Corrective Action
(40 CFR § 264.90(a)(2), § 264.101, § 270.1(c) and § 270.51)

The Permittee is required to continue this Permit for any period necessary to comply with the Corrective Action requirements of this Permit.

I.D.4. Cost Estimate for Corrective Action
(40 CFR § 264.90(a)(2) and § 264.101)

I.D.4.a. The Permittee shall prepare a cost estimate for the completion of any Corrective Action required under this Permit for SWMUs or AOCs in order to provide financial assurance for completion of Corrective Action as required under 40 CFR § 264.90(a)(2) and § 264.101. Such cost estimate shall be based upon the cost of assessment of all affected media, and the design, installation, operation, inspection, monitoring, and maintenance of the Corrective Action system to meet the requirements of 40 CFR § 264.101 and this Permit to include any treatment system necessary for all affected media. Such cost estimate will include the full cost (100%) of Corrective Action as defined by Condition I.G.3. of this Permit. The cost estimate shall also cover the total third party cost of implementing the Corrective Action, including any necessary long-term Corrective Action costs. Third-party costs are described in 40 CFR § 264.142 (a)(2) and shall include all direct costs and also all indirect costs (including contingencies) as described in the EPA Directive No. 9476.00-6 (November, 1986), Volume III, Chapter 10. The cost estimate shall

contain sufficient details to allow it to be evaluated by the U.S. Environmental Protection Agency (EPA).

I.D.4.b. The Permittee shall submit the cost estimate for completion of Corrective Action required under 40 CFR § 264.90(a)(2) and § 264.101 and this Permit within one hundred twenty (120) calendar days of the effective date of this Permit.

I.D.4.c. The Permittee shall annually adjust the cost estimate for inflation sixty (60) calendar days prior to the anniversary date of the establishment of the financial assurance mechanism unless using a financial test or corporate guarantee, in which case the estimate shall be updated thirty (30) calendar days after the close of the Permittee's fiscal year.

I.D.4.d. The Permittee shall submit cost adjustments for modifications to the Corrective Action plan to the EPA within thirty (30) calendar days after receiving approval of the modification if the change increases the cost of Corrective Action.

I.D.5. Financial Assurance for Corrective Action
(40 CFR § 264.90(a)(2) and § 264.101)

I.D.5.a. The Permittee shall demonstrate continuous compliance with 40 CFR § 264.90(a)(2) and § 264.101 by providing documentation of financial assurance using a mechanism described in 40 CFR § 264.140 through § 264.151 in at least the amount of the cost estimate required under Condition I.D.4.

I.D.5.b. The Permittee shall submit financial assurance for the full cost of Corrective Action as required under 40 CFR § 264.90(a)(2) and § 264.101 no later than sixty (60) calendar days after the approval of the cost estimate described in Conditions I.D.4. and I.D.5.a. of this Permit.

I.D.5.c. The Permittee may use the mechanisms described in 40 CFR § 264.140 through § 264.151 for financial assurance for Corrective Action. References to regulatory requirements for "closure and/or post-closure care" shall be replaced with the phrase "closure, post-closure care, and/or corrective action."

I.D.6. Need to Halt or Reduce Activity Not a Defense
(40 CFR § 270.30(c))

The Permittee shall not assert as a defense that the Permittee must halt or reduce permitted activities in order to maintain compliance with the conditions of this Permit in the event of an enforcement action.

I.D.7. Duty to Mitigate
(40 CFR § 270.30(d))

In the event of noncompliance with the Permit, the Permittee shall take all reasonable steps to minimize Releases of Hazardous Waste or Hazardous Constituents to the environment, and shall carry out such measures as are reasonable to prevent significant adverse effects on human health or the environment.

I.D.8. Proper Operation and Maintenance
(40 CFR § 270.30(e))

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve and maintain compliance with the conditions of the Permit.

I.D.9. Duty to Provide Information
(40 CFR § 270.30(h))

The Permittee shall furnish to the Regional Administrator, within a reasonable time, any relevant information which the Regional Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to the Regional Administrator, upon request, copies of any record required to be kept by this Permit or required to be kept per applicable RCRA requirements of 40 CFR Parts 260, 261, 264, 266, and 268.

I.D.10. Inspection and Entry
(40 CFR § 270.30(i))

The Permittee shall allow the Regional Administrator, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

a. Enter the Permittee’s premises where a RCRA regulated activity is located or conducted, or where records must be kept under the conditions of this Permit and applicable RCRA requirements;

b. Have access to and copy any records that must be kept under the conditions of this Permit and applicable RCRA requirements;

c. Inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated, or required under this Permit or subject to RCRA; and

d. Sample or monitor for the purposes of assuring permit compliance or as otherwise authorized by RCRA, any substances or parameters at any location.

I.D.11. Monitoring and Records
(40 CFR § 264.74(b) and § 270.30(j))

I.D.11.a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative waste sample to be analyzed must be the appropriate method from Appendix I of 40 CFR Part 261, the EPA Region 4 Field Branches Quality System and Technical Procedures (most recent version), or an equivalent method approved by the Regional Administrator. Procedures for sampling contaminated media must be those identified in the EPA Region 4 Field Branches Quality System and Technical Procedures, or an equivalent method approved by the Regional Administrator. Laboratory methods must be those specified in the most recent edition of Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, or an equivalent method approved by the Regional Administrator.

I.D.11.b. As provided for under 40 CFR Part 264, the Permittee shall retain at the Facility or other appropriate location as approved by the Regional Administrator, records of all monitoring information required under the terms of this Permit and applicable monitoring and record keeping required for applicable requirements of 40 CFR Parts 260, 261, 264, 266, and 268; including all calibration and maintenance records, records of all data used to prepare documents required by this Permit, copies of all reports and records required by this Permit, the certification required by 40 CFR § 264.73(b)(9), and records of all data used to complete the application for this Permit for a period of at least three (3) years from the date of the sample, measurement, report, certification or application, or until Corrective Action is completed, whichever date is later. As a generator of Hazardous Waste, the Permittee shall retain a copy of all notices, certifications, demonstrations, waste analysis data, and other documentation produced pursuant to 40 CFR Part 268 for at least three (3) years from the date that the waste which is the subject of such documentation was last sent for on-site or off-site treatment, storage, or disposal, or until Corrective Action is completed, whichever date is later. These periods may be extended by request of the Regional Administrator at

any time and are automatically extended during the course of any unresolved enforcement action regarding this Facility.

I.D.11.c. Records of monitoring information shall specify:

i. The dates, exact place, and times of sampling, or measurements;
ii. The individuals who performed the sampling or measurements;
iii. The dates the analyses were performed;
iv. The name of the laboratory which performed the analyses;
v. The analytical techniques or methods used; and
vi. The results of such analyses.

I.D.12. Reporting Planned Changes
(40 CFR § 270.30(l)(1)-(2))

The Permittee shall give written notice to the Regional Administrator as soon as possible of any planned physical alterations or additions, including Permittee-initiated Interim Measures (IM) under Condition II.F.1.b., which impact known or suspected contamination at or from SWMUs or AOCs referenced in Conditions II.A.1., II.A.2., II.A.3., and II.C. The notice shall include at a minimum, a summary of the planned change, the reason for the planned change, a discussion of the impact(s) the planned change will have on the ability to investigate contamination at or from the SWMU or AOC, and a discussion of the impact(s) the planned change will have on the known or suspected contamination.

I.D.13. Anticipated Noncompliance
(40 CFR § 270.30(l)(2))

The Permittee shall give advance notice to the Regional Administrator of any planned changes in the permitted Facility or activity which may result in noncompliance with the requirements of this Permit.

I.D.14. Transfer of Permit
(40 CFR § 264.12(c), § 270.30(l)(3) and § 270.40)

This Permit may be transferred to a new owner or operator only after notice to the Regional Administrator and only if the Permit is modified or revoked and reissued pursuant to 40 CFR § 270.40(b) or § 270.41(b)(2) to identify the new owner or operator and incorporate such other requirements as may be necessary under the appropriate Act. Before transferring ownership or operation of the Facility during its operating life, or of a disposal facility during the post-closure care period, the Permittee shall notify the new owner or operator in writing of the requirements of 40 CFR Parts 264 and 270, the Hazardous and Solid Waste Amendments (HSWA) of 1984, and this Permit.

I.D.15. Compliance Schedules
(40 CFR § 270.33)

Written notification of compliance or noncompliance with any item identified in the Corrective Action Schedule of Compliance in Appendix D of this Permit shall be submitted according to each schedule date. If the Permittee does not notify the Regional Administrator within fourteen (14) calendar days of its compliance or noncompliance with the schedule, the Permittee shall be subject to an enforcement action. Submission of a required item according to the schedule constitutes notification of compliance.

I.D.16. Twenty-four Hour Reporting
(40 CFR § 264.56(d), § 270.30(l) (6) and § 270.30(h))

I.D.16.a. The Permittee shall report any noncompliance or any imminent or existing hazard from a Release of Hazardous Waste or Hazardous Constituents which may endanger human health or the environment. Any such information shall be reported orally to the Regional Administrator within twenty-four (24) hours from the time the Permittee becomes aware of the circumstances. This report shall include:

i. Information concerning the Release of any Hazardous Waste or Hazardous Constituents which may endanger public drinking water supplies.
ii. Information concerning the Release or discharge of any Hazardous Waste or Hazardous Constituents, or of a fire or explosion at the Facility, which could threaten the environment or human health outside the Facility.

I.D.16.b. The description of the occurrence and its cause shall include:

i. Name, address, and telephone number of the owner or operator;
ii. Name, address, and telephone number of the Facility;
iii. Date, time, and type of incident;
iv. Name and quantity of materials involved;
v. The extent of injuries, if any;
vi. An assessment of actual or potential hazards to the environment and human health outside the Facility; and
vii. Estimated quantity and disposition of recovered material that resulted from the incident.

I.D.16.c. A written report shall also be provided to the Regional Administrator within fifteen (15) calendar days of the time the Permittee becomes aware of the circumstances. The written report shall contain the information specified under Conditions I.D.16.a. and b.; a description of the noncompliance or imminent hazard and its cause; the periods of noncompliance (including exact dates and times); whether the noncompliance or imminent hazard has been corrected, and if

not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance or imminent hazard.

I.D.17. Other Noncompliance
(40 CFR § 270.30(l)(10))

The Permittee shall report all other instances of noncompliance not otherwise required to be reported in accordance with Condition I.D.16., at the time written reports as required by this Permit are submitted. The reports shall contain the information listed in Condition I.D.16., as appropriate.

I.D.18. Other Information
(40 CFR § 270.30(l)(11))

Whenever the Permittee becomes aware that the Permittee failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report(s) or document(s) submitted to the Regional Administrator, the Permittee shall promptly submit such facts or information.

I.E. SIGNATORY REQUIREMENT
(40 CFR § 270.11 and § 270.30(k))

All applications, reports, or information submitted to the Regional Administrator shall be signed and certified in accordance with 40 CFR § 270.11.

I.F. CONFIDENTIAL INFORMATION
(40 CFR § 270.12 and 40 CFR Part 2)

The Permittee may claim confidential any information required to be submitted by this Permit in accordance with 40 CFR § 270.12.

I.G. DEFINITIONS
(40 CFR Parts 124, 260, 261, 264, 270 and RCRA, as amended)

For purposes of this Permit, terms used herein shall have the same meaning as those in RCRA and 40 CFR Parts 124, 260, 261, 264, 268 and 270, unless this Permit specifically provides otherwise. Where terms are not defined in the regulations, the Permit, or EPA guidelines or publications, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

I.G.1. The term **"Area of Concern" (AOC)** for purposes of this Permit includes any area having a probable Release of a Hazardous Waste or Hazardous Constituent which is not from a SWMU and is determined by the Regional Administrator to

pose a current or potential threat to human health or the environment. Such AOCs may require investigations and remedial action as required under Section 3005(c)(3) of RCRA and 40 CFR § 270.32(b)(2) in order to ensure adequate protection of human health and the environment.

I.G.2. An **"Area of Contamination"** is a discrete contiguous area of generally dispersed contamination that can be considered a RCRA Unit (usually Landfills/soils). Because an Area of Contamination is equated to a RCRA land-based Unit, consolidation and *in situ* treatment of Hazardous Waste within the Area of Contamination do not create a new point of Hazardous Waste generation for purposes of RCRA. An Area of Contamination allows wastes to be consolidated or treated *in situ* within the Area of Contamination without triggering Land Disposal restrictions or minimum technology requirements.

I.G.3. **"Corrective Action"** shall be defined as all activities, including activities conducted beyond the Facility boundary, that are proposed or implemented to facilitate assessment, monitoring, and active or passive remediation of Releases of Hazardous Waste or Hazardous Constituents to soil, groundwater, surface water, or the atmosphere associated with SWMUs and/or AOCs and/or Areas of Contamination located at the Facility or off-site, as required by 40 CFR § 264.100 and § 264.101, or as otherwise required and specified by this Permit.

I.G.4. A **"Corrective Action Management Unit" (CAMU)** for purposes of this Permit means an area, designated by the Regional Administrator within a Facility, used only for managing Remediation Wastes for implementing Corrective Action or cleanup at the Facility.

I.G.5. "**Corrective Measures"** for purposes of this Permit, include all Corrective Action necessary to protect human health and the environment for all Releases of Hazardous Waste or Hazardous Constituents from any SWMU or AOC at the Facility, regardless of the time at which waste was placed in the Unit, as required under 40 CFR § 264.101. Corrective Measures may address Releases to air, soils, surface water or groundwater.

I.G.6. "**Extent of Contamination"** for the purposes of this Permit is defined as the horizontal and vertical area in which the concentrations of Hazardous Constituents in the environmental media being investigated are above detection limits or background concentrations indicative of the region, whichever is appropriate as determined by the Regional Administrator.

I.G.7. **"Facility"** for purposes of this Permit includes all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of Hazardous Waste. A Facility may consist of several treatment, storage, or disposal operational Units (*e.g.*, one or more Landfills, surface

impoundments, or combination of them). For the purposes of implementing Corrective Action under 40 CFR § 264.101, a Facility includes all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA.

I.G.8. **A "Hazardous Waste"** means a Solid Waste, or combination of Solid Wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (a) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (b) pose a substantial or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of or otherwise managed. For further clarification, of the definition of "Hazardous Waste," refer to 40 CFR § 260.10 and § 261.3.

I.G.9. A "**Hazardous Constituent"** for purposes of this Permit are those substances listed in 40 CFR Part 261 Appendix VIII and Part 264 Appendix IX, or any substance deemed appropriate by the Regional Administrator.

I.G.10. **"Institutional Controls"** for purposes of this Permit are non-engineered instruments, such as administrative and legal controls, that help minimize the potential for human exposure to contamination and/or protect the integrity of the Corrective Measures.

I.G.11. **"Interim Measures"** (IM) for purposes of this Permit are actions necessary to minimize or prevent the further migration of contaminants and limit actual or potential human and environmental exposure to contaminants while long-term Corrective Action remedies are evaluated and, if necessary, implemented.

I.G.12. **"Land Disposal"** for purposes of this Permit and 40 CFR Part 268 means placement in or on the land, except for a CAMU or staging pile, and includes, but is not limited to, placement in a Landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, underground mine or cave, or placement in a concrete vault, or bunker intended for disposal purposes.

I.G.13. **"Landfill"** for purposes of this Permit includes any disposal facility or part of a facility where Hazardous Waste is placed in or on the land and which is not a pile, a land treatment facility, a surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a CAMU.

I.G.14. **"Regional Administrator"** means the Regional Administrator for the EPA Region in which the Facility is located, or his/her designee.

I.G.15. A **"Release"** for purposes of this Permit includes any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of any Hazardous Waste or Hazardous Constituents.

I.G.16. **"Remedy Construction"** shall mean the event when the State or the EPA acknowledges in writing that the RCRA Facility has completed construction of a Facility's remedy that was designed to achieve long-term protection of human health and the environment and that the remedy is fully functional as designed, whether or not final cleanup levels or other requirements have been achieved. Remedy Construction may be site-wide or pertain only to specific areas of the Facility. Remedy Construction is defined by the RCRAInfo database code CA550.

I.G.17. A **"Remedy Decision"** shall mean the event by which the State or the EPA formally selects a remedy designed to meet RCRA Corrective Action long-term goals of protection of human health and the environment. A Remedy Decision may be site-wide or pertain only to specific areas of the Facility. Remedy Decision is defined by the RCRAInfo database code CA400.

I.G.18. **"Remediation Waste"** for purposes of this Permit means all Solid Wastes and Hazardous Wastes, and all media (including groundwater, surface water, soils, and sediments) and debris that are managed for implementing cleanup.

I.G.19. **"Screening Levels"** for purposes of this Permit are health-based or environmental-based concentrations of Hazardous Constituents determined to be indicators for the protection of human health and/or the environment.

I.G.20. **"Solid Waste"** means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under Section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923). For further clarification of the definition of "Solid Waste," refer to 40 CFR § 260.10 and § 261.2.

I.G.21. A **"Solid Waste Management Unit" (SWMU)** for purposes of this Permit includes any Unit, which has been used for the treatment, storage, or disposal of Solid Waste at any time, irrespective of whether the Unit is or ever was intended for the management of Solid Waste. RCRA regulated Units are also SWMUs. SWMUs include areas that have been contaminated by routine and systematic

Releases of Hazardous Waste or Hazardous Constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to Solid Waste management activities (*e.g.*, product or process spills).

I.G.22. A **"Statement of Basis"** is a document that describes the process the EPA uses under RCRA to select measures for containing or cleaning up contamination at a hazardous waste management facility. Specific information in the Statement of Basis typically includes: description and environmental setting of the facility, names and concentrations of contaminants detected at the facility and associated exposure pathways, selected remedy, innovative technologies considered in determining the remedy, and public involvement requirements under the Corrective Action.

I.G.23. A **"Temporary Unit" (TU)** for purposes of this Permit includes any temporary tanks and/or container storage areas used solely for treatment or storage of hazardous Remediation Wastes during specific remediation activities. Designated by the Regional Administrator, such Units must conform to specific standards, and may only be in operation for a period of time as specified in this Permit.

I.G.24. A "**Unit"** for the purposes of this Permit includes, but is not limited to, any Landfill, surface impoundment, waste pile, land treatment unit, incinerator, injection well, tank, container storage area, septic tank, drain field, wastewater treatment unit, elementary neutralization unit, transfer station, recycling unit, boiler, industrial furnace, thermal treatment system, mechanical treatment system, open burn, open detonation, chemical treatment system or other miscellaneous unit which has been or is used for the management of, or has or is contacting RCRA subject Hazardous Waste or Hazardous Constituents.

PART II - CORRECTIVE ACTION

II.A. APPLICABILITY
(40 CFR Part 264 Subpart F, 40 CFR § 264.101(a), § 270.32(b)(2), RCRA § 3005(c))

The Conditions of this Part apply to:

II.A.1. The SWMUs and AOCs identified in Appendix A, Table 1, which require no further action under Part II of this Permit at this time;

II.A.2. Any additional SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means. As used in this Part of the Permit, the terms "discover," "discovery," or "discovered" refer to the date on which the Permittee either, (1) visually observes evidence of a new SWMU or AOC, (2) visually observes evidence of a previously unidentified Release of Hazardous Constituents to the environment, or (3) receives information which suggests the presence of a new Release of Hazardous Waste or Hazardous Constituents to the environment; and

II.A.3. Contamination that has migrated and/or is migrating beyond the Facility boundary. The Permittee shall implement Corrective Actions beyond the Facility boundary where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of the Regional Administrator that, despite the Permittee's best efforts, as determined by the Regional Administrator, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a Release that has migrated beyond the Facility boundary where off-site access is denied. On-site measures to address such Releases will be determined on a case-by-case basis. Assurances of financial responsibility for completion of such off-site Corrective Action shall be required.

II.B. NEWLY IDENTIFIED SWMUs AND AOCs
(40 CFR § 270.14(d), RCRA § 3005(c))

II.B.1. The Permittee shall notify the Regional Administrator in writing, within fifteen (15) calendar days of discovery, of any suspected new AOC as discovered under Condition II.A.2. The notification shall include, at a minimum, the location of the AOC and all available information pertaining to the nature of the Release (*e.g.*, media affected, Hazardous Constituents released, magnitude of Release, etc.). The Regional Administrator may conduct, or require the Permittee to conduct, further assessment (*i.e.*, Confirmatory Sampling as outlined in Condition II.D.) in order to determine the status of the suspected AOC. The Regional Administrator will notify the Permittee in writing of the final determination as to the status of the suspected AOC. If the Regional Administrator determines that further

investigation of an AOC is required, this Permit will be modified in accordance with 40 CFR § 270.41.

II.B.2. The Permittee shall notify the Regional Administrator in writing, within fifteen (15) calendar days of discovery, of any additional SWMUs as discovered under Condition II.A.2.

II.B.3. The Permittee shall prepare and submit to the Regional Administrator, within ninety (90) calendar days of notification, a SWMU Assessment Report (SAR) for each SWMU identified under Condition II.B.2. At a minimum, the SAR shall provide the following information:

a. Location of Unit(s) on a topographic map of appropriate scale such as required under 40 CFR § 270.14(b)(19).

b. Designation of type and function of Unit(s).

c. General dimensions, capacities and structural description of Unit(s) (supply any available plans/drawings).

d. Dates that the Unit(s) was operated.

e. Specification of all wastes that have been managed at/in the Unit(s) to the extent available. Include any available data on Hazardous Constituents in the wastes.

f. All available information pertaining to any Release of Hazardous Waste or Hazardous Constituents from such Unit(s) (to include groundwater data, soil analyses, air, and/or surface water data).

II.B.4. Based on the results of the SAR, the Regional Administrator shall determine the need for further investigations at the SWMUs covered in the SAR. If the Regional Administrator determines that such investigations are needed, the Permittee shall be required to prepare a plan for such investigations as outlined in Conditions II.D.1. or II.E.1.a.

II.C. NEWLY DISCOVERED RELEASES FROM SWMUs or AOCs
(40 CFR § 270.14(d), RCRA § 3005(c))

II.C.1. The Permittee shall notify the Regional Administrator in writing of any newly discovered Release(s) of Hazardous Waste or Hazardous Constituents discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, within fifteen (15) calendar days of discovery. Such newly discovered Releases may be from SWMUs or AOCs identified in Condition

II.A.1. or SWMUs or AOCs identified in Condition II.A.2. for which further investigation under Condition II.B.4. was not required.

II.C.2. If the Regional Administrator determines that further investigation of the SWMUs or AOCs is needed, the Permittee shall be required to prepare a plan for such investigations as outlined in Condition II.E.1.a.

II.D. CONFIRMATORY SAMPLING (CS)
(40 CFR § 270.14(d))

II.D.1. Upon notification by the Regional Administrator, the Permittee shall prepare and submit a Confirmatory Sampling (CS) Work Plan for suspected AOCs per Condition II.B.1. or newly identified SWMUs per Condition II.B.4. The work plan shall be submitted within forty-five (45) calendar days of notification by the Regional Administrator that a CS Work Plan is required. The CS Work Plan shall include schedules of implementation and completion of specific actions necessary to determine whether a Release has occurred. It should also address applicable requirements and affected media. In order to partly or wholly satisfy the CS requirement, previously existing data may be submitted with the work plan for the Regional Administrator's consideration.

II.D.2. The CS Work Plan must be approved by the Regional Administrator, in writing, prior to implementation. The Regional Administrator shall specify the start date of the CS Work Plan schedule in the letter approving the CS Work Plan. If the Regional Administrator disapproves the CS Work Plan, the Regional Administrator shall either (1) notify the Permittee in writing of the CS Work Plan's deficiencies and specify a due date for submission of a revised CS Work Plan, (2) revise the CS Work Plan and notify the Permittee of the revisions, or (3) conditionally approve the CS Work Plan and notify the Permittee of the conditions.

II.D.3. The Permittee shall implement the CS in accordance with the approved CS Work Plan.

II.D.4. The Permittee shall prepare and submit to the Regional Administrator in accordance with the schedule in the approved CS Work Plan, a CS Report identifying all SWMUs or AOCs that have released Hazardous Waste or Hazardous Constituents into the environment. The CS Report shall include all data, including raw data and a summary and analysis of the data, that supports the above determination. If submission of the CS Report coincides with submission of the RFI Report, then the CS Report and the RFI Report may be combined into one submission.

II.D.5. Based on the results of the CS Report, the Regional Administrator shall determine the need for further investigations at the SWMUs or AOCs covered in the CS

Report. If the Regional Administrator determines that such investigations are needed, the Permittee shall be required to prepare a plan for such investigations as outlined in Condition II.E.1.a. The Regional Administrator will notify the Permittee of any no further action decision.

II.E. RCRA FACILITY INVESTIGATION (RFI)
(40 CFR § 264.101)

The Permittee has previously performed a RFI on four (4) SWMUs/AOCs and a SWMU assessment on SWMU 8. These SWMUs/AOCs, along with four (4) others, which were not recommended for an RFI, require no further action at this time and are identified in Appendix A, Table 1.

II.E.1. RFI Work Plan(s)

II.E.1.a. The Permittee shall prepare and submit to the Regional Administrator, within ninety (90) calendar days of notification by the Regional Administrator, an RFI Work Plan for those Units identified under Condition II.B.4., Condition II.C.2., or Condition II.D.5. The RFI Work Plan(s) shall be developed to meet the requirements of Condition II.E.1.b.

II.E.1.b. The RFI Work Plan(s) shall meet the requirements as specified in Appendix B unless otherwise directed by the Regional Administrator. The RFI Work Plan(s) shall include schedules of implementation and completion of specific actions necessary to determine the nature and Extent of Contamination and the potential pathways of contaminant Releases to the air, soil, surface water, and groundwater. The Permittee must provide sufficient justification and associated documentation that a Release is not probable or has already been characterized if a Unit or a media/pathway associated with a Unit (groundwater, surface water, soil, subsurface gas or air) is not included in the RFI Work Plan(s). Such deletions of a Unit, media or pathway from the RFI(s) are subject to the approval of the Regional Administrator. The Permittee shall provide sufficient written justification for any omissions or deviations from the minimum requirements of Appendix B. Such omissions or deviations are subject to the approval of the Regional Administrator. In addition, the scope of the RFI Work Plan(s) shall include all investigations necessary to ensure compliance with 40 CFR § 264.101(c).

II.E.1.c. The RFI Work Plan(s) must be approved by the Regional Administrator, in writing, prior to implementation. The Regional Administrator shall specify the start date of the RFI Work Plan schedule in the letter approving the RFI Work Plan(s). If the Regional Administrator disapproves the RFI Work Plan(s), the Regional Administrator shall either (1) notify the Permittee in writing of the RFI Work Plan's deficiencies and specify a due date for submission of a revised RFI Work Plan, (2) revise the RFI Work Plan and notify the Permittee of the revisions

and the start date of the schedule within the approved RFI Work Plan, or (3) conditionally approve the RFI Work Plan and notify the Permittee of the conditions.

II.E.2. RFI Implementation

The Permittee shall implement the RFI(s), as outlined in Appendix B, in accordance with the approved RFI Work Plan(s). The Permittee shall notify the Regional Administrator at least twenty (20) calendar days prior to any sampling activity.

II.E.3. RFI Reports

II.E.3.a The Permittee shall prepare and submit to the Regional Administrator Draft and Final RFI Report(s) for the investigations conducted pursuant to the RFI Work Plan(s) submitted under Condition II.E.1. The Draft RFI Report(s) shall be submitted to the Regional Administrator for review in accordance with the schedule in the approved RFI Work Plan(s). The Final RFI Report(s) shall be submitted to the Regional Administrator within thirty (30) calendar days of receipt of the Regional Administrator's final comments on the Draft RFI Report. The RFI Report(s) shall include an analysis and summary of all required investigations of SWMUs and AOCs and their results. The summary shall describe the type and Extent of Contamination at the Facility, including sources and migration pathways, identify all Hazardous Constituents present in all media, and describe actual or potential receptors. The RFI Report(s) shall also describe the Extent of Contamination (qualitative/quantitative) in relation to background levels indicative of the area. If the RFI Report is a summary of only the initial phase investigatory work or based on current investigations and further investigation is necessary, then an Interim RFI Report summarizing the initial phase investigation shall be submitted incorporating a work plan for the final phase investigatory actions required based on the initial findings. Approval of the final phase work plan shall be carried out in accordance with Condition II.E.1.c. The objective of this task shall be to ensure that the investigation data are sufficient in quality (*e.g.*, quality assurance procedures have been followed) and quantity to describe the nature and Extent of Contamination, potential threat to human health and/or the environment, and to support a Corrective Measures Study (CMS), if necessary.

II.E.3.b. The Permittee shall submit to the Regional Administrator, along with the Interim and Final RFI Report(s), Screening Levels based on the latest EPA guidance or as otherwise directed by the Regional Administrator for each of the Hazardous Constituents reported in Condition II.E.3.a.

II.E.3.c. The Regional Administrator will review the RFI Report(s), including the Screening Levels described in Condition II.E.3.b. The Regional Administrator

shall notify the Permittee of the need for further investigative action if necessary and, if appropriate at this moment of the investigation, inform the Permittee, if not already notified, of the need for a CMS to meet the requirements of Condition II.G. and 40 CFR § 264.101. The Regional Administrator will notify the Permittee of any no further action decision. Any further investigative action required by the Regional Administrator shall be prepared and submitted in accordance with a schedule specified by the Regional Administrator and approved in accordance with Condition II.E.1.c.

II.E.3.d. If the time required to conduct the RFI(s) is greater than one hundred eighty (180) calendar days, the Permittee shall provide the Regional Administrator with quarterly RFI Progress Reports (90-day intervals) beginning ninety (90) calendar days from the start date specified by the Regional Administrator in the RFI Work Plan approval letter. The RFI Progress Reports shall contain the following information at a minimum:

i. A description of the portion of the RFI completed;
ii. Summaries of findings;
iii. Summaries of any deviations from the approved RFI Work Plan during the reporting period;
iv. Summaries of any significant contacts with local community public interest groups or State government;
v. Summaries of any problems or potential problems encountered during the reporting period;
vi. Actions taken to rectify problems;
vii. Changes in relevant personnel;
viii. Projected work for the next reporting period; and
ix. Copies of daily reports, inspection reports, data, etc.

II.F. INTERIM MEASURES (IM)

(40 CFR § 264.101)

II.F.1. IM Work Plan

II.F.1.a. The Regional Administrator may require Interim Measures (IM) if they are necessary to protect human health and the environment (considering specific site conditions and federal regulations).

Upon notification by the Regional Administrator, the Permittee shall prepare and submit an IM Work Plan for any SWMU or AOC for which the Regional Administrator determines IM are necessary. IM are necessary in order to minimize or prevent the further migration of contaminants and to limit actual or potential human and environmental exposure to contaminants while long-term Corrective Action remedies are evaluated and, if necessary, implemented. The IM Work Plan

shall be submitted within thirty (30) calendar days of such notification and shall include the elements listed in II.F.1.c. Such IM may be conducted concurrently with investigations required under the terms of this Permit.

Units having an approved IM Work Plan shall comply with Condition II.F.2 and beyond to govern implementation of the IM requirements for the Unit(s).

II.F.1.b. The Permittee may initiate IM at a SWMU or AOC by submitting the appropriate notification pursuant to Condition I.D.12. The Regional Administrator will process Permittee-initiated IM by either conditionally approving the IM or imposing an IM Work Plan per Condition II.F.1.a. Permittee-initiated IM shall be considered conditionally approved unless the Regional Administrator specifically imposes an IM Work Plan within thirty (30) calendar days of receipt of notification of the Permittee-initiated IM. The scope and success of Permittee-initiated IM conditionally approved per Condition II.F.1.b. shall be subject to subsequent in-depth review by the Regional Administrator; the Regional Administrator will either comment on or approve the Permittee-initiated IM. Permittee-initiated IM must follow the progress and final reporting requirements in Condition II.F.3.

II.F.1.c. The IM Work Plan shall ensure that the IM are designed to mitigate any current or potential threat(s) to human health or the environment and are consistent with and integrated into any long-term solution at the Facility. The IM Work Plan shall include: the IM objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.

II.F.1.d. The IM Work Plan imposed under Condition II.F.1.a. must be approved by the Regional Administrator, in writing, prior to implementation. The Regional Administrator shall specify the start date of the IM Work Plan schedule in the letter approving the IM Work Plan. If the Regional Administrator disapproves the IM Work Plan, the Regional Administrator shall either (1) notify the Permittee in writing of the IM Work Plan's deficiencies and specify a due date for submission of a revised IM Work Plan, (2) revise the IM Work Plan and notify the Permittee of the revisions and the start date of the schedule within the approved IM Work Plan, or (3) conditionally approve the IM Work Plan and notify the Permittee of the conditions.

II.F.2. IM Implementation

II.F.2.a. The Permittee shall implement the IM imposed under Condition II.F.1.a. in accordance with the approved IM Work Plan.

II.F.2.b. The Permittee shall give notice to the Regional Administrator as soon as possible of any planned changes, reductions or additions to the IM Work Plan imposed under Condition II.F.1.a. or initiated by the Permittee under Condition II.F.1.b.

II.F.2.c. Final approval of Corrective Action required under 40 CFR § 264.101, which is achieved through IM shall be in accordance with 40 CFR § 270.41 and Condition II.H. as a permit modification.

II.F.3. IM Reports

II.F.3.a. If the time required for completion of IM imposed under Condition II.F.1.a. or implemented under Condition II.F.1.b. is greater than one year, the Permittee shall provide the Regional Administrator with progress reports at intervals specified in the approved IM Work Plan, or semi-annually for Permittee-initiated IM. Such IM progress reports shall contain the following information at a minimum:

i. A description of the portion of the IM completed;
ii. Summaries of findings;
iii. Summaries of any deviations from the IM Work Plan during the reporting period;
iv. Summaries of any problems or potential problems encountered during the reporting period; and
v. Projected work for the next reporting period.

II.F.3.b. The Permittee shall prepare and submit an IM Report to the Regional Administrator, within ninety (90) calendar days of completion of IM conducted under Condition II.F. The IM Report shall contain the following information at a minimum:

i. A description of IM implemented;
ii. Summaries of results;
iii. Summaries of all problems encountered;
iv. Summaries of accomplishments and/or effectiveness of IM;
v. Copies of all relevant laboratory/monitoring data, etc. in accordance with Condition I.D.11.

II.G. CORRECTIVE MEASURES STUDY (CMS)
(40 CFR § 264.101 and § 264.552)

II.G.1. The Permittee shall prepare and submit to the Regional Administrator a CMS for those SWMUs and AOCs where Hazardous Constituents have come to be located at concentrations exceeding those appropriate for the protection of human health and the environment. The CMS shall be developed to meet the requirements of Condition II.G.2. The Permittee may seek approval from the Regional

Administrator for concurrent RFI/CMS. The CMS may be performed concurrent with the RFI process if the Regional Administrator determines that sufficient investigative details are available to allow concurrent action.

II.G.2. The CMS shall meet the requirements of Appendix C of this Permit at a minimum. The CMS shall include schedules of implementation and completion of specific actions necessary to complete a CMS. The Permittee must provide sufficient justification and/or documentation for any Unit deleted from the CMS. Such deletion of a Unit is subject to the approval of the Regional Administrator. The scope of the CMS shall include all investigations necessary to ensure compliance with RCRA § 3005(c)(3) and 40 CFR § 264.101, § 264.552, and § 270.32(b)(2). The Permittee shall implement Corrective Actions beyond the Facility boundary, as set forth in Condition II.A.3.

II.G.3. The Permittee shall submit the draft CMS no later than ninety (90) calendar days of notification by the Regional Administrator that a CMS is required.

II.G.4. The Regional Administrator shall either approve or disapprove, in writing, the CMS. If the Regional Administrator disapproves the CMS, the Regional Administrator shall either (1) notify the Permittee in writing of the CMS's deficiencies and specify a due date for submission of a revised CMS, (2) revise the CMS and notify the Permittee of the revisions, or (3) conditionally approve the CMS and notify the Permittee of the conditions. This modified CMS becomes the approved CMS.

II.H. REMEDY APPROVAL AND PERMIT MODIFICATION
(40 CFR § 264.101, § 264.552, § 270.41 and § 270.42)

II.H.1. A Remedy Decision (CA400) shall be selected from the remedial alternatives evaluated in the CMS. It will be based at a minimum on protection of human health and the environment, as per specific site conditions and existing regulations and reflected in a Statement of Basis. The selected remedy may include any IM implemented to date.

II.H.2. The EPA will provide the public an opportunity to review and comment on the Statement of Basis. Pursuant to 40 CFR § 270.41, a permit modification will be initiated by the Regional Administrator after recommendation of a remedy under Condition II.H.1. This modification will serve to incorporate a final remedy, including a CAMU if necessary, and CMS remedy implementation schedules into this Permit. The permit modification shall include a schedule and date for Remedy Construction (CA550).

II.H.3. Following the public comment period, the EPA may approve the CMS and select a final Corrective Measure(s) or require the Permittee to revise the CMS and/or perform an additional CMS.

II.H.4. The EPA will notify the Permittee of the final Corrective Measure(s) selected by the EPA in the Final Decision and Response to Comments. The notification will include the EPA's reasons for selecting the Corrective Measure(s).

II.H.5. Upon the effective date of the permit modification approving the selected remedy, the Permittee shall implement the approved remedy per the CMS remedy implementation schedule. The Permittee shall submit Corrective Measures Implementation and Effectiveness Reports to the Regional Administrator annually.

II.H.6. Within one hundred and twenty (120) calendar days after this Permit has been modified for remedy selection, the Permittee shall update the cost estimates and financial assurance consistent with the requirements of Condition I.D.4.

II.I INSTITUTIONAL CONTROLS

II.I.1. The Permittee must consider institutional or other appropriate non-engineering controls for protection of human health and the environment from contamination left in place at any SWMUs or AOCs. Among the Institutional Controls to be considered is an environmental covenant pursuant to the Mississippi Uniform Environmental Covenants Act ("UECA"), Miss. Code Ann. §§ 89-23-1, et seq.

II.I.2. A detailed listing of Institutional Controls that may be used can be found in the Institutional Controls Matrix in Appendix E of this Permit.

II.I.3. Institutional Controls may be used to protect the Corrective Measures implemented at the Facility if this Permit is terminated at the completion of Corrective Action. Institutional Controls should be implemented prior to termination of this Permit.

II.I.4. Institutional Controls that are approved as part of the final remedy shall survive the termination of this Permit.

II.I.5. Institutional Controls may be placed upon the Facility or on any specifically identified area of SWMUs or AOCs. Institutional Controls may restrict the use of the property covered by such Institutional Control to commercial and/or industrial land use, as those terms are currently defined, or may be defined in the future, by zoning ordinance(s) of the city, county or any other local governmental entity with jurisdiction and authority to regulate the land use at the property.

II.J. COMPLETION OF CORRECTIVE ACTION
(40 CFR § 264.101)

II.J.1. The Corrective Action shall be considered complete when the Regional Administrator determines that: a) compliance with the media cleanup standards and the cleanup objectives has been achieved, and b) all actions required to control the source(s) of contamination have been satisfied.

II.J.2. Corrective Action shall be considered complete with or without controls in place where the Permittee has satisfied all obligations under RCRA Section 3004(u) and (v).

II.J.3. Upon completion of the Corrective Action for the entire Facility or a portion of the Facility or any off-site contamination, the Permittee shall submit to the Regional Administrator, by registered mail, a request for termination of the Corrective Action Schedule of Compliance according to the procedures for Class 3 modifications in 40 CFR § 270.42. The request shall include a certification that the Corrective Measures have been completed in accordance with the requirements agreed upon by the EPA.

II.J.4. When, upon receipt of the certification, and in consideration of public comments and any other relevant information, the Regional Administrator determines that the Corrective Measures have been completed in accordance with the terms and conditions of this Permit and the requirements for completion, the Regional Administrator shall: a) terminate the HSWA Permit or b) modify the Permit to terminate the Corrective Action Schedule of Compliance for SWMUs and AOCs that require no further action at this time. Upon termination of the Permit or modification of the Permit for completion of Corrective Action at the entire Facility, the EPA shall release the Permittee from the financial assurance requirements of this Permit.

II.K. CORRECTIVE ACTION SCHEDULE OF COMPLIANCE MODIFICATION
(40 CFR § 264.101(b) and § 270.41(a)(4))

II.K.1. If at any time the Regional Administrator determines that modification of the Corrective Action Schedule of Compliance in Appendix D is necessary, the Regional Administrator may initiate a modification to the Corrective Action Schedule of Compliance.

II.K.2. Modifications that are initiated and finalized by the Regional Administrator will be in accordance with the applicable provisions of 40 CFR Part 270. The Permittee may also request a permit modification in accordance with 40 CFR Part 270 to change the Corrective Action Schedule of Compliance.

II.L. WORK PLAN AND REPORT REQUIREMENTS
(40 CFR § 270.11 and § 270.30(k))

II.L.1. All work plans and schedules shall be subject to approval by the Regional Administrator prior to implementation to assure that such work plans and schedules are consistent with the requirements of this Permit and with applicable regulations. Any approved schedule of implementation contained in any work plan, addendum, or additional phases becomes part of the Permit. The Permittee shall revise all submissions and schedules as specified by the Regional Administrator. Upon approval, the Permittee shall implement all work plans and schedules as written.

II.L.2. All work plans and reports shall be submitted in accordance with the approved schedule. Extensions of the due date for submissions may be granted by the Regional Administrator based on the Permittee's demonstration that sufficient justification for the extension exists.

II.L.3. If the Permittee at any time determines that the SAR information required under Condition II.B.4., the CS Work Plan under Condition II.D.1., or RFI Work Plan(s) required under Condition II.E.1. no longer satisfy the requirements of 40 CFR § 264.101 or this Permit for prior or continuing Releases of Hazardous Waste or Hazardous Constituents from SWMUs and/or AOCs, the Permittee shall submit an amended work plan(s) to the Regional Administrator within ninety (90) calendar days of such determination.

II.L.4. Two (2) copies of all reports and work plans and an electronic version of the same reports/work plans shall be provided by the Permittee to the Regional Administrator in care of the Corrective Action Section Chief at the following address:

U.S. Environmental Protection Agency, Region 4
Attn: Chief, Corrective Action Section
Restoration and Underground Storage Tank Branch
RCRA Division
61 Forsyth Street, SW
Atlanta, Georgia 30303

II.M. APPROVAL/DISAPPROVAL OF SUBMISSIONS
(40 CFR § 264.101)

The Regional Administrator or delegated representative will review the work plans, reports, schedules, and other documents ("submissions") which require the Regional Administrator's approval in accordance with the conditions of this Permit. The Regional Administrator will notify the Permittee in writing of any submission that is disapproved, and the basis therefore. Condition II.N. shall apply

only to submissions that have been disapproved and revised by the Regional Administrator, or that have been disapproved by the Regional Administrator, then revised and re-submitted by the Permittee, and again disapproved by the Regional Administrator.

II.N. DISPUTE RESOLUTION
(40 CFR § 264.101)

Notwithstanding any other provision in this Permit, in the event the Permittee disagrees, in whole or in part, with the Regional Administrator's revision of a submission or disapproval of any revised submission required by the Permit, and decides to invoke dispute resolution under this Condition II.N., the following shall apply:

II.N.1. In the event that the Permittee chooses to invoke the provisions of this paragraph, the Permittee shall notify the Regional Administrator in writing within thirty (30) calendar days of receipt of the Regional Administrator's revision of a submission or disapproval of a revised submission. Such notice shall set forth the specific matters in dispute, the position the Permittee asserts should be adopted as consistent with the requirements of the Permit, the basis for the Permittee's position, and any matters considered necessary for the Regional Administrator's determination.

II.N.2. The Regional Administrator and the Permittee shall have an additional thirty (30) calendar days from the EPA's receipt of the notification provided for in Condition II.N.1. to meet or confer to resolve any disagreement.

II.N.3. In the event agreement is reached, the Permittee shall comply with the terms of such agreement, or if appropriate submit the revised submission and implement the same in accordance with and within the time frame specified in such agreement.

II.N.4. If agreement is not reached within the thirty (30) calendar day period, the Regional Administrator will notify the Permittee in writing of his/her decision on the dispute, and the Permittee shall comply with the terms and conditions of the Regional Administrator's decision in the dispute. For the purposes of this provision in this Permit, the responsibility for making this decision shall not be delegated below the RCRA Division Director level.

II.N.5. With the exception of those conditions under dispute, the Permittee shall proceed to take any action required by those portions of the submission and of the Permit that the Regional Administrator determines are not affected by the dispute.

APPENDIX A

SAFETY-KLEEN CORPORATION
FIGURES AND TABLES

FIGURE 1: FACILITY MAP

(referenced per Condition I.A. EFFECT OF PERMIT)

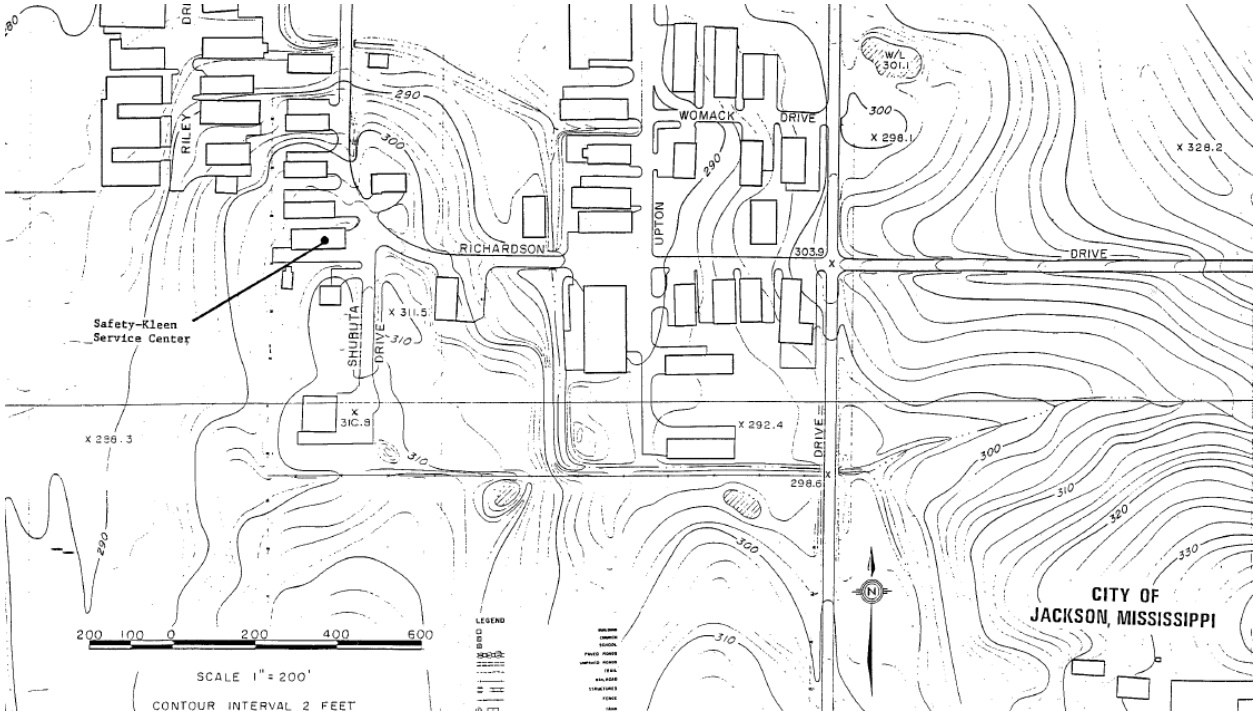

FIGURE 2: SWMUs and AOCs LOCATION MAP

(referenced per Condition I.A. EFFECT OF PERMIT)

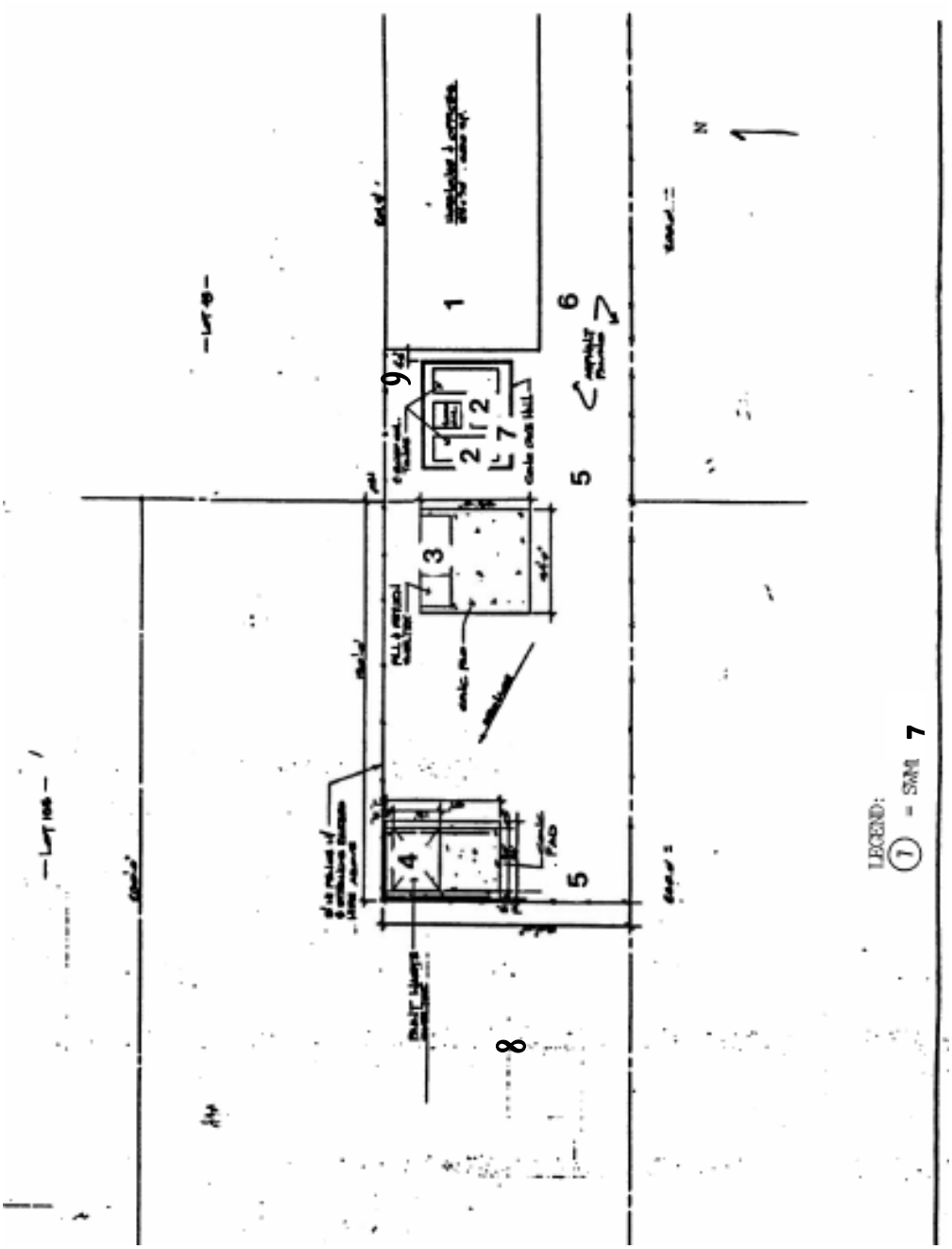

TABLE 1. SWMUs and AOCs Requiring No Further Action At This Time

SWMU/ AOC	Type of Unit	Unit Comment	Dates of Operation	Potentially Affected Media
SWMU 1 Container Storage Area	Drum Storage Area	This is a RCRA-permitted container storage unit which is authorized to store a total of 4,464 gallons of hazardous waste. MDEQ issued a Hazardous Waste Management Permit (Permit No. HW-89-765-01) to Safety-Kleen on November 3, 2000, which authorizes the facility to store immersion cleaner (F002, F004), dry cleaning waste (D001, F002), parts washer waste (D001), loading unit sediment (D001), spent antifreeze, metal halide light bulbs, and other non-hazardous wastes and products. The unit may also be used to store other characteristic wastes that are identified with the following waste codes: D004 through D011, D018, D019, D021 through D030, and D032 through D043. Wastes are stored in 16-, 30-, 55- and 85-gallon drums, 5-gallon pails and boxes. The unit is located inside the facility warehouse area (which is a sheet metal building with a sealed concrete floor) and has a secondary containment system with a capacity of 448.8 gallons. The facility's HSWA Permit, issued on November 15, 2000 required No Further Action (NFA) for this unit. In addition, EPA issued another NFA determination for the entire facility on June 4, 2008. No evidence of a release has been identified at this unit during multiple RCRA inspections conducted by EPA (Inspections dated March 1, 1990, April 9, 1991, April 29, 1999, and June 24, 2007) or in the available file material.	1974 to Present	Air, Soil and Groundwater

TABLE 1. SWMUs and AOCs Requiring No Further Action At This Time

SWMU/ AOC	Type of Unit	Unit Comment	Dates of Operation	Potentially Affected Media
SWMU 2 Waste Solvent Tanks	Tank Storage Area	This RCRA-permitted unit consists of one 8,000-gallon tank, and one 4,000-gallon tank permitted to store waste mineral spirits (D001, D006, and D008) and other characteristic wastes identified with the hazardous waste codes D004 through D011, D018, D019, D021through D030 and D032 through D043. The tanks reside within a concrete vault containment system, consisting of poured, reinforced concrete and polyurethane coated and sealed construction. The containment capacity is approximately 22,000 gallons. The current containment system only became operational in 1985 when the tanks came back under interim status. The October 9, 1992, HSWA Permit required that a RCRA Facility Investigation (RFI) be conducted at the unit due to the facility's historical practice of dumping potentially contaminated stormwater captured in the unit onto surrounding soils. A RFI consisting of confirmatory sampling was conducted at this unit. The July 15, 1997, RFI Report indicated that no hazardous constituents were detected at the unit at concentrations that exceeded residential risk-based concentrations. The facility's HSWA Permit, issued on November 15, 2000, required NFA for this unit. In addition, EPA issued another NFA determination for the entire facility on June 4, 2008.	1979 to Present	Air, Soil and Groundwater

TABLE 1. SWMUs and AOCs Requiring No Further Action At This Time

SWMU/ AOC	Type of Unit	Unit Comment	Dates of Operation	Potentially Affected Media
SWMU 3 Work Area	Solvent Return/Fill Area	This unit is a self-contained structure constructed entirely of sheet metal on the roof and three sides of the unit. All dirty mineral spirits (D001, D006, and D008) drums are returned to this unit on a daily basis. The base of the unit consists of a six-inch-deep metal pan with a capacity of approximately 1,100 gallons. This pan is designed to manage any spills from the activities at the unit. Approximately three feet above the pan is the steel grating which serves as the floor for the solvent return/fill activities. Three solvent return dumpsters are embedded in this floor (resting on the pan below). The unit was moved to its current location in approximately 1988. Prior to that time, it was located approximately 50 feet south and east of its current location. No history of release was found in the file material, and none was observed on the unit's current location during the 1990 Visual Site Inspection (VSI); however, a number of stains were observed at the unit's original location. The October 9, 1992 HSWA Permit required that a RFI be conducted at the unit due to evidence of staining at the former location of the unit. A RFI consisting of confirmation sampling was conducted at this unit. The July 15, 1997, RFI Report indicated that no hazardous constituents were detected at the unit at concentrations that exceeded residential risk-based concentrations. The facility's HSWA Permit, issued on November 15, 2000, required NFA for this unit. In addition, EPA issued another NFA determination for the entire facility on June 4, 2008.	1979 to Present	Air, Soil and Groundwater
SWMU 4 Paint Waste Shelter	Ignitable Waste Storage Area	This RCRA unit has a permitted capacity of 2,184 gallons and is authorized for the storage of ignitable wastes (primarily waste paint-related materials (D001, D006, D007, D008, F003, and F005) or solvent sludge (D001 and D006). The unit is constructed of sheet steel, with a floor of steel grating to allow any releases to be contained in the underlying pan. No evidence of release was found in the available file material, and no releases were noted during multiple RCRA inspections conducted by EPA (Inspections dated March 1, 1990, April 9, 1991, April 29, 1999, and June 24, 2007). The facility's HSWA Permit, issued on November 15, 2000, required NFA for this unit. In addition, EPA issued another NFA determination for the entire facility on June 4, 2008.	1979 to Present	Air, Soil and Groundwater

TABLE 1. SWMUs and AOCs Requiring No Further Action At This Time

SWMU/ AOC	Type of Unit	Unit Comment	Dates of Operation	Potentially Affected Media
SWMU 5 Facility Stormwater Runoff Control	Stormwater Control Area	The unit is an integral part of the concrete working/parking area and is designed to transfer rainwater from all working areas of the facility to its western margin. As such, it is simply a low point in the concrete which slopes towards the western edge of the facility. A concrete flume is located at the terminus of the unit. This portion of the unit acts to transfer the stormwater away from the facility in an attempt to minimize erosion. During the 1990 VSI, a number of stains were noted at the unit. These stains appeared to be associated with the former location of the Work Area (SWMU 3). The 1990 RFA Report also noted that some runoff from the rainwater exited the facility on its southern side on an approximated line with the southern edge of the facility building. Stormwater formed a small pool at the base of the unit's western discharge point and appeared to drain to an unimproved area of the facility. The October 9, 1992 HSWA Permit required that a RFI be conducted at the unit due to evidence of staining at the former location of the unit. A RFI consisting of confirmatory sampling was conducted at this unit. The July 15, 1997 RFI Report indicated that no hazardous constituents were detected at the unit at concentrations that exceeded residential risk-based concentrations. The facility's HSWA Permit, issued on November 15, 2000, required NFA for this unit. In addition, EPA issued another NFA determination for the entire facility on June 4, 2008.	1988 to Present	Air, Soil and Groundwater

TABLE 1. SWMUs and AOCs Requiring No Further Action At This Time				
SWMU/ AOC	**Type of Unit**	**Unit Comment**	**Dates of Operation**	**Potentially Affected Media**
SWMU 6 Truck Washing Area	Truck Wash Area	This unit is used for washing facility trucks and is located near the garage entrance to SWMU 1. Biodegradable soap is used. All washwater flows to the west along SWMU 5, and is eventually discharged to bare soil in the unimproved portion of the facility. The unit generates wastewater from truck washing activities. The wastewater may be contaminated with mineral spirits from spills which occur within the trucks or with oil from the trucks. The October 9, 1992 HSWA Permit required that a RFI be conducted at the unit since the method of operation at the unit would cause it to release to the environment. A RFI consisting of confirmatory sampling was conducted at this unit. The July 15, 1997 RFI Report indicated that no hazardous constituents were detected at the unit at concentrations that exceeded residential risk-based concentrations. The facility's HSWA Permit, issued on November 15, 2000, required NFA for this unit. In addition, EPA issued another NFA determination for the entire facility on June 4, 2008.	1979 to Present	Air, Soil and Groundwater
SWMU 7 Tanker Truck Load/Unload Area	Clean and Waste Solvent Transfer Area	This unit is located within the containment system of the Waste Solvent Tanks (SWMU 2). The unit consists of a concrete area immediately adjacent to the piping used to load and unload spent solvent (D001, D006, and D008) and product solvent. No evidence of a release from this unit was identified in the historical file material and none was observed during multiple RCRA inspections conducted by EPA (Inspections dated March 1, 1990, April 9, 1991, April 29, 1999 and June 24, 2007). The facility's HSWA Permit, issued on November 15, 2000, required NFA for this unit. In addition, EPA issued another NFA determination for the entire facility on June 4, 2008.	1979 to Present	Air, Soil and Groundwater

TABLE 1. SWMUs and AOCs Requiring No Further Action At This Time

SWMU/ AOC	Type of Unit	Unit Comment	Dates of Operation	Potentially Affected Media
SWMU 8 Onsite Drainage Flume	Stormwater Runoff Area	The unit receives potentially contaminated runoff from the facility parking area and adjacent roads. During a visit conducted on June 24, 2007, EPA inspectors noted visibly stained soils in the vicinity immediately downgradient of the Onsite Drainage Flume. The facility submitted a SWMU Assessment Report (SAR) to EPA on January 29, 2008. According to the 2008 SAR Report, the facility excavated approximately 13 cubic yards of soil from the area in question. Confirmatory surface soil samples were collected and analyzed for volatile organic constituents. No hazardous constituents were detected in the confirmatory surface soil samples at concentrations which exceeded their constituent-specific residential risk-based standards. On March 26, 2008, EPA issued a NFA determination for this unit.	2008 to Present	Air, Soil and Groundwater
SWMU 9 Return and Fill Dumpster/Drum Washing Unit	Return and Fill Dumpster/Drum Washing Unit	This RCRA-permitted Miscellaneous Unit consists of two square metal boxes that open up like a clam shell. Each box is approximately the size of a 55-gallon drum. The unit is situated within an open-sided steel shed and is underlain by secondary containment. The unit manages spent solvent wastes generated from the cleaning of drums. No evidence of a release from this unit was identified in the historical file material and none was observed during the June 24, 2007 site inspection conducted by EPA.	2000 to Present	Air, Soil and Groundwater

APPENDIX B: RCRA FACILITY INVESTIGATION (RFI) OUTLINE

The purpose of the RCRA Facility Investigation (RFI) portion of the RCRA corrective action process is to evaluate the nature and extent of releases of hazardous wastes and/or hazardous constituents and to gather necessary data to support the Corrective Measures Study (CMS) and/or Interim Measures (IM). Planning for the investigation is best accomplished through a logical progression of tasks:

1. Gather information on the source of the release(s) to the environment (Source Characterization),
2. Gather information on the physical aspects of the environment which will affect the migration and fate of the release and identification of exposure pathways for both humans and non-human members of the environment (Environmental Setting),
3. Use Source Characterization and Environmental Setting to develop a conceptual model of the release which will be used to plan and conduct a program to define the nature, rate and extent of the release (Sampling and Analysis Plan).

An RFI Work Plan and RFI Report are generally required elements of the RCRA corrective action process. The requirements for a full, detailed RFI are listed in this Appendix. EPA recognizes that each facility is unique. Therefore, the scope and requirements of the RFI shall be focused to fit the complexity of the site-specific situation. The work plan requirements listed in this Appendix in no way limit the site-specific opportunities for a Permittee. For example, the RFI may be implemented in phases. Relevant information contained in previously developed documents, such as a RCRA Part B permit application, may be referenced as appropriate, but must be summarized in either the RFI Work Plan or the RFI Report. In addition, EPA understands that Risk Assessments are becoming more widely utilized to place characterization information into context and to aid in determining remedial solutions. If a Risk Assessment is expected to be performed in the future, note that Region 4 has developed a series of Risk Bulletins to provide Permittees and their contractors with the general format and process Region 4 expects a Risk Assessment to follow.

Additionally, EPA has developed guidance for the use of generic regional screening levels (RSLs) for most hazardous constituents of concern to enable simple risk evaluations through comparisons with the actual release concentration measured in the soil or water at the facility SWMUs/AOCs. These generic RSLs are conservative health-based concentrations of hazardous constituents determined to be risk indicators for the protection of human health or the environment. The most current User's Guide and table of RSLs can be found at the EPA Region 3 web site:

http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm

EPA Region 4 recommends use of these generic RSLs as guidance for both Superfund and RCRA sites. For several frequently detected industrial contaminants (lead, arsenic, PAHs, PCBs, dioxins, etc.), EPA has also developed risk based cleanup levels for residential or industrial land use scenarios.

In some cases, it may be possible to implement the RFI concurrent with the CMS (also see Appendix C). This approach can save time and money because the earlier in the corrective action process potential remedies can be identified, the more effectively information gathering can be focused. The EPA anticipates that a concurrent RFI/CMS approach may be appropriate in the following types of situations, among others: facilities where removal remedies have been proposed by the owner/operator, facilities with straightforward remedial solutions or where presumptive remedies can be applied, facilities where few remedial options are available, and facilities where the remedy is phased. The EPA will determine on a case-by-case basis if a concurrent RFI/CMS is appropriate. Because of the unique data collection requirements necessary for a remedial solution which includes natural attenuation of contaminants in groundwater, if natural attenuation is expected to be part of the remedial solution, then the Sampling and Analysis Plan should be crafted to include monitoring of specific water quality parameters unique to natural attenuation (*e.g.*, nitrites/nitrates, ferrous iron, sulfides, dissolved oxygen, methane, hydrogen, etc.).

I. RFI WORK PLAN REQUIREMENTS - ELEMENTS OF THE RFI WORK PLAN

The RFI Work Plan shall include, at a minimum, the following elements:

A. Introduction - Summary of any relevant existing assessment data

The Permittee shall describe the purpose or objective of the RFI Work Plan and provide a summary of any existing environmental data which is relevant to the investigation. The summary should provide the following items, at a minimum:

1. Land ownership history,
2. Facility operating dates,
3. Facility's product(s),
4. Raw materials used in facility operations, wastes generated,
5. Nature and extent of any known contamination,
6. Summary of ongoing Interim Measures and past assessments, and
7. Summary of permit objective and how this objective will be satisfied.

B. Environmental Setting

The Permittee shall provide information on the environmental setting at the facility. The Permittee shall characterize the Environmental Setting as it relates to identified sources, pathways and areas of releases of hazardous constituents from Solid Waste Management Units (SWMUs) and/or Areas of Concern (AOCs). Data gaps pertinent to characterization

of releases shall be identified and provisions made in Section E of the RFI Work Plan Requirements to obtain the relevant information to fill the data gap. The Environmental Setting shall cover the following items, at a minimum:

1. Hydrogeology

The Permittee shall provide a summary of the hydrogeologic conditions at the facility. This discussion shall include, but not be limited to, the following information:

a. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting groundwater flow beneath the facility, including:

i. Regional and facility specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;
ii. Structural geology: description of local and regional structural features (*e.g.*, folding, faulting, tilting, jointing, metamorphic foliation, etc.);
iii. Depositional history;
iv. Regional and facility specific groundwater flow patterns (porous media, fracture media, karst media); and
v. Identification and characterization of areas and amounts of recharge and discharge (springs in karst terrain, base level streams and rivers).

b. An analysis of any topographic features that might influence the groundwater flow system (*e.g.*, sinkholes and sinking streams in karst terrains).

c. Based on any existing field data, tests (*e.g.*, pump tests, tracer tests), and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (*i.e.*, the aquifers and any intervening saturated and unsaturated units), including:

i. Hydraulic conductivity and porosity (total and effective), groundwater flow velocity, groundwater basin discharge;
ii. Lithology, grain size, sorting, degree of cementation;
iii. An interpretation of hydraulic interconnections between saturated zones (*i.e.*, aquifers) and surface waters; and
iv. The attenuation capacity and mechanisms of the natural earth materials (*e.g.*, ion exchange capacity, organic carbon content, mineral content, etc.).

d. Based on data obtained from groundwater monitoring wells and piezometers installed upgradient, water wells and/or springs downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring including:

i. Water level contour and/or potentiometric maps, including seasonal variations;
ii. Hydrologic cross sections showing vertical gradients;
iii. The flow system, including the vertical and horizontal components of flow; and
iv. Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences and for karst terrain, storm flow.

e. A description of man-made influences that may affect the hydrology of the site, identifying:

i. Local water supply and production wells with an approximate schedule of pumping; and
ii. Man-made hydraulic structures (pipelines, French drains, ditches, roofs, runways, parking lots, etc.).

2. Soils

The Permittee shall provide an explanation of the soil and rock units above the water table in the vicinity of contaminant release(s). This summary may include, but not be limited to, the following types of information as appropriate:

i. Surface soil distribution;
ii. Soil profile, including ASTM classification of soils;
iii. Transects of soil stratigraphy;
iv. Hydraulic conductivity (saturated and unsaturated);
v. Relative permeability;
vi. Bulk density;
vii. Porosity;
viii. Soil sorption capacity;
ix. Cation exchange capacity (CEC);
x. Soil organic content;
xi. Soil pH;
xii. Particle size distribution;
xiii. Depth of water table;
xiv. Moisture content;
xv. Effect of stratification on unsaturated flow;
xvi. Infiltration;

xvii. Evapotranspiration;
xviii. Storage capacity;
xix. Vertical flow rate; and
xx. Mineral content.

3. Surface Water and Sediment

The Permittee shall provide a description of the surface water bodies in the vicinity of the facility. This summary may include, but not be limited to, the following activities and information:

a. Description of the temporal and permanent surface water bodies including:

i. For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;
ii. For impoundments: location, elevation, surface area, depth, volume, freeboard, and construction and purpose;
iii. For streams, ditches, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, flooding tendencies (*i.e.*, 100 year event), discharge point(s), and general contents.
iv. Drainage patterns; and
v. Evapotranspiration.

b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients, chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.

c. Description of sediment characteristics including:

i. Deposition area;
ii. Thickness profile; and
iii. Physical and chemical parameters (*e.g.*, grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

4. Air

The Permittee shall provide information characterizing the climate in the vicinity of the facility. Such information may include, but not be limited to:

a. A description of the following parameters:

i. Annual and monthly rainfall averages;

ii. Monthly temperature averages and extremes;
iii. Wind speed and direction;
iv. Relative humidity/dew point;
v. Atmospheric pressure;
vi. Evaporation data;
vii. Development of inversions; and
viii. Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence (*i.e.*, hurricanes)

b. A description of topographic and man-made features which affect air flow and emission patterns, including:

i. Ridges, hills or mountain areas;
ii. Canyons or valleys;
iii. Surface water bodies (*e.g.*, rivers, lakes, bays, etc.); and
iv. Buildings.

C. Source Characterization

For those sources from which releases of hazardous constituents have been detected, the Permittee shall provide analytical data to completely characterize the wastes and the areas where wastes have been placed, to the degree that is possible without undue safety risks, including: type, quantity; physical form; disposition (containment or nature of deposits); and facility characteristics affecting release (e.g., facility security, and engineering barriers). Data gaps on source characterization shall be identified and provisions made in Section E to obtain the relevant information to fill the data gap. This summary shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal Area Characteristics:

a. Location of unit/disposal area;
b. Type of unit/disposal area;
c. Design features;
d. Operating practices (past and present)
e. Period of operation;
f. Age of unit/disposal area;
g. General physical conditions; and
h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of wastes placed in the unit;

i. Hazardous classification (*e.g.*, flammable, reactive, corrosive, oxidizing or reducing agent);
ii. Quantity; and
iii. Chemical composition.

b. Physical and chemical characteristics such as:

i. Physical form (solid, liquid, gas);
ii. Physical description (*e.g.*, powder, oily sludge);
iii. Temperature;
iv. pH;
v. General chemical class (*e.g.*, acid, base, solvent);
vi. Molecular weight;
vii. Density;
viii. Boiling point;
ix. Viscosity;
x. Solubility in water;
xi. Cohesiveness of the waste; and
xii. Vapor pressure.

c. Migration and dispersal characteristics of the waste such as:

i. Sorption capability;
ii. Biodegradability, bioconcentration, and biotransformation;
iii. Photodegradation rates;
iv. Hydrolysis rates; and
v. Chemical transformations.

D. Potential Receptors

The Permittee shall provide data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Data gaps pertinent to receptor analysis shall be identified and provisions made in Section E to obtain the relevant information to fill the data gap. The following characteristics shall be identified at a minimum:

1. Current local uses and planned future uses of groundwater:

a. Type of use (*e.g.*, drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial);
b. Location of groundwater users, to include withdrawal and discharge wells and springs, within one mile of the impacted area.

The above information should also indicate the aquifer or hydrogeologic unit used and/or impacted for each item.

2. Current local uses and planned future uses of surface waters directly impacted by the facility:

    a. Domestic and municipal (*e.g.*, potable and lawn/gardening watering);
    b. Recreational (*e.g.*, swimming, fishing);
    c. Agricultural;
    d. Industrial; and
    e. Environmental (*e.g.*, fish and wildlife propagation).

3. Human use of or access to the facility and adjacent lands, including but not limited to:

    a. Recreation;
    b. Hunting;
    c. Residential;
    d. Commercial; and
    e. Relationship between population locations and prevailing wind direction.

4. A general description of the biota in surface water bodies on, adjacent to, or affected by the facility.

5. A general description of the ecology within the area adjacent to the facility.

6. A general demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.

7. A description of any known or documented endangered or threatened species near the facility.

E. Sampling and Analysis Plan(s) for Characterization of Releases of Hazardous Waste/Hazardous Constituents

The Permittee shall prepare a plan to document all monitoring procedures necessary to characterize the extent, fate and transport of releases (*i.e.*, identify sample locations, sample procedures and sample analysis to be performed during the investigation to characterize the environmental setting, source, and releases of hazardous constituents, so as to ensure that all information and data are valid and properly documented). The sampling strategy and procedures shall be in accordance with the EPA Region 4 Field Branches Quality System and Technical Procedures (most recent version). Any deviations from this reference must be requested by the applicant and approved by the EPA. If a Risk Assessment is expected to be performed once release characterization is complete or

nearly complete, Data Quality Objectives (DQO) for a Human Health Risk Assessment requires a Data Quality Objective of Level 3 or greater.

The Sampling and Analysis Plan must specifically discuss the following unless the EPA Region 4 Field Branches Quality System and Technical Procedures (most recent version procedures are specifically referenced.

1. Sampling Strategy

    a. Selecting appropriate sampling locations, depths, etc.;
    b. Obtaining all necessary ancillary data;
    c. Determining conditions under which sampling should be conducted;
    d. Determining which media are to be sampled (*e.g.*, groundwater, air, soil, sediment, subsurface gas);
    e. Determining which parameters are to be measured and where;
    f. Selecting the frequency of sampling and length of sampling period;
    g. Selecting the types of samples (*e.g.*, composite vs. grab) and number of samples to be collected.

2. Sampling Procedures

    a. Documenting field sampling operations and procedures, including:

        i. Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (*e.g.*, filters, preservatives, and absorbing reagents);
        ii. Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
        iii. Documentation of specific sample preservation method;
        iv. Calibration of field instruments;
        v. Submission of appropriate blanks (*e.g.*, field, equipment, trip, etc.);
        vi. Potential interferences present at the facility;
        vii. Construction materials and techniques, associated with monitoring wells and piezometers;
        viii. Field equipment listing and sampling containers;
        ix. Sampling order; and
        x. ix. Decontamination procedures.

    b. Selecting appropriate sample containers;

    c. Sampling preservation; and

    d. Chain-of-custody, including:

i. Standardized field tracking reporting forms to establish sample custody in the field prior to shipment;
ii. Pre-prepared sample labels containing all information necessary for effective sample tracking; and
iii. Chain-of-custody seals for sample containers and shipping coolers.

3. Sample Analysis

Sample analysis shall be conducted in accordance with SW-846: "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods" (most recent version) or an alternate approved method. The sample analysis section of the Sampling and Analysis Plan shall specify the following:

a. Chain-of-custody procedures, including:

i. Identification of a responsible party to act as sampling custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;
ii. Provision for a laboratory sample custody log consisting of serially numbered standard lab tracking report sheets; and
iii. Specification of laboratory sample custody procedures for sample handling, storage, and dispersal for analysis.

b. Sample storage (*e.g.*, maximum holding times for constituents);

c. Sample preparation methods;

d. Analytical Procedures, including:

i. Scope and application of the procedure;
ii. Sample matrix;
iii. Potential interferences;
iv. Precision and accuracy of the methodology; and
v. Method Detection Limits; and
vi. Practical Quantitative Limits.

e. Calibration procedures and frequency;

f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

i. Method blank(s);
ii. Laboratory control sample(s);
iii. Calibration check sample(s);
iv. Replicate sample(s);
v. Matrix-spiked sample(s);
vi. "Blind" quality control sample(s);
vii. Control charts;
viii. Surrogate samples;
ix. Zero and span gases; and
x. Reagent quality control checks.

h. External quality control checks by EPA, including:

i. Spikes and blanks at sampling events for which EPA or its technical representative provides oversight; and
ii. The equivalent of a CLP data package for samples split with EPA or for which EPA specifically requests the package.

i. Preventive maintenance procedures and schedules;

j. Corrective action (for laboratory problems); and

k. Turnaround time.

F. Data Management Plan

The Permittee shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

a. Unique sample or field measurement code;
b. Sampling or field measurement location and sample or measurement type;
c. Sampling or field measurement raw data;
d. Laboratory analysis ID number;
e. Property or component measures; and
f. Result of analysis (*e.g.*, concentration, data qualifiers).

2. Tabular Displays

The following data shall be presented in tabular displays:

a. Unsorted (raw) data;
b. Results for each medium, or for each constituent monitored;
c. Data reduction for statistical analysis, as appropriate;
d. Sorting of data by potential stratification factors (*e.g.*, location, soil layer, topography); and
e. Summary data.

3. Graphical Displays

The following data shall be presented in graphical formats (*e.g.*, bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

a. Display sampling location and sampling grid:
b. Indicate boundaries of sampling area, and area where more data are required;
c. Display geographical extent of contamination, both horizontally and vertically;
d. Illustrate changes in concentration in relation to distances from the source, time, depth or other parameters; and
e. Indicate features affecting inter-media transport and show potential receptors.

G. Project Management Plan - Schedule of Implementation

Permittee shall prepare a Project Management Plan which will cover qualifications of personnel categories and the management control structure for the project. The Permittee shall also provide a schedule for completing the planned RFI activities. The schedule shall be as specific as possible (*i.e.*, it should indicate the number of days/weeks/months required for each major work plan task).

II. RFI REPORT REQUIREMENTS - ELEMENTS OF THE RFI REPORT

The RFI Report shall include, at a minimum, the following elements:

A. Introduction

The Permittee shall describe the purpose of the RFI Work Plan and provide a summary description of the project.

B. Environmental Setting

The Permittee shall describe the Environmental Setting in and around the facility. The RFI Work Plan should contain some, if not all, of the information on the Environmental Setting. Any information collected during work plan implementation which clarifies or improves understanding of the Environmental Setting should be provided in this section.

C. Source Characterization

The Permittee shall summarize the sources of contamination and nature of releases identified at the facility. The RCRA Facility Assessment and the RFI Work Plan should contain some, if not all, of the information on Source Characterization. Any information collected during work plan implementation or obtained from the sources (*e.g.*, voluntarily or from other Environmental Programs) which directly addresses Source Characterization should be provided in this section.

D. Sampling and Analysis Results

The Permittee shall present data results obtained pursuant to the RFI Work Plan. The Permittee shall identify any work plan proposals which were not completed and explain why such actions were not finished. The Permittee shall also present its analysis/interpretation of how the sampling data meet the RFI objective and how the sampling data fits or modifies the contaminant conceptual model. For all analytical data, the Permittee shall discuss the results of data quality/data review.

E. Data Quality Assurance/Data Quality Data Review

The Permittee shall perform a Quality Assurance/Quality Control data review on all data present in the RFI. The Quality Assurance/Quality Control data review shall be in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA-540/R94-013) and the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA-540/R94-012). The data review shall address the following, at minimum:

a. Holding times;
b. Blanks;
c. Laboratory Control Samples;
d. Field Duplicates;
e. Surrogate Recoveries;
f. Matrix Spike/Matrix Spike Duplicates; and
g. Data Assessment - Data Usability.

F. Conclusions

The Permittee shall summarize the major conclusions reached after analysis of the environmental setting, source characterization, sampling and analysis results and data quality. Any data gaps, needed to complete characterization of the scope and extent of the releases from SWMUs and/or AOCs or to refine further the contaminant conceptual model, shall be identified and recommendations made in the Recommendations Section of the report.

G. Recommendations

The Permittee shall provide its recommendations on what, if any, further action is needed to complete the characterization of release(s) from SWMUs and/or AOCs.

H. Work Plan for Additional Investigations

If further investigations are determined to be needed to complete the objective of the RFI, then the Permittee shall provide a work plan to complete characterization of the release(s).

APPENDIX C: CORRECTIVE MEASURES STUDY (CMS) OUTLINE

The purpose of the Corrective Measures Study (CMS) portion of the RCRA corrective action process is to identify and evaluate potential remedial alternatives for the releases of hazardous constituents that have been identified at the facility through the RCRA Facility Investigation (RFI) or other investigations to need further evaluation. The scope and requirements of the CMS are balanced with the expeditious initiation of remedies and rapid restoration of contaminated media. The scope and requirements of the CMS should be focused to fit the complexity of the site-specific situation. It is anticipated that Permittees with sites with complex environmental problems may need to evaluate a number of technologies and corrective measure alternatives. For other facilities, however, the evaluation of a single corrective measure alternative may be adequate. Therefore, a streamlined or focused approach to the CMS may be initiated. Information gathered during any stabilizations or interim measures will be used to augment the CMS and in cases where corrective action goals are met, may be a substitute for the final CMS.

The requirements for a full, detailed CMS are listed below. The Agency has the flexibility not to require sections of the study, where site-specific situations indicate that all requirements are not necessary. Additionally, the Agency may require additional studies besides these discussed in order to support the CMS.

I. Corrective Measures Study (CMS)

The detail of a CMS may vary based upon the complexity of the site, on-going Interim Measures, etc. However, the CMS may include the following elements:

A. Introduction/Purpose

The Permittee shall describe the purpose of the CMS and provide a summary description of the project.

B. Description of Current Situation

The Permittee shall submit a summary and an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation (RFI) Report. This discussion should concentrate on those issues which could significantly affect the evaluation and selection of the corrective measures alternative(s). The Permittee shall provide an update to information presented in the RFI regarding previous response activities and interim measures which have

or are being implemented at the facility. The Permittee shall also make a facility-specific statement of the purpose for the response, based on the results of the RFI. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

C. Establishment of Proposed Media Specific Cleanup Standards

The Permittee shall describe the proposed media cleanup standards and point of compliance. The standards must be either background, promulgated federal and state standards or risk-derived standards. If media clean-up standards are not proposed, then the Agency will unilaterally propose setting media clean-up standards to either background, promulgated federal and state standards or the most conservative risk-derived standards.

D. Identification, Screening and Development of Corrective Measure Technologies

1. Identification: List and briefly describe potentially applicable technologies for each affected media that may be used to achieve the corrective action objectives. Include a table that summarizes the available technologies.

   The Permittee should consider innovative treatment technologies, especially in situations where there are a limited number of applicable corrective measure technologies.

2. Screening: The Permittee shall screen the corrective measure technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations.

   Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

   a. Site Characteristics: Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration.

   b. Waste Characteristics: Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these

waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and Land Disposal (on/off-site).

c. Technology Limitations: During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

3. Corrective Measure Development: The Permittee shall assemble the technologies that pass the screening step into specific alternatives that have the potential to meet the corrective action objectives for each media. Options for addressing less complex sites could be relatively straight-forward and may only require evaluation of a single or limited number of alternatives. Each alternative may consist of an individual technology or a combination used in sequence (*i.e.*, treatment train). Different alternatives may be considered for separate areas of the facility, as appropriate. List and briefly describe each corrective measure alternative.

E. Evaluation of a Final Corrective Measure Alternative

For each remedy which warrants a more detailed evaluation (*i.e.*, those that passed through the screening step), including those situations when only one remedy is being proposed, the Permittee shall provide detailed documentation of how the potential remedy will comply with each of the standards listed below. These standards reflect the major technical components of remedies including cleanup of releases, source control and management of wastes that are generated by remedial activities. The specific standards are as follows:

1. Protect human health and the environment.
2. Attain media cleanup standards set by the EPA.
3. Control the source of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment.
4. Comply with applicable standards for management of wastes.
5. Other factors.

In evaluating the selected alternative or alternatives, the Permittee shall prepare and submit information that documents that the specific remedy will meet the standards listed above. The following guidance should be used in completing this evaluation.

1. Protect Human Health and the Environment

   Corrective action remedies must be protective of human health and the environment. Remedies may include those measures that are needed to be protective, but are not directly related to media cleanup, source control or management of wastes. An example would be a requirement to provide alternative drinking water supplies in order to prevent exposures to releases from an aquifer used for drinking water purposes. Therefore, the Permittee shall provide a discussion of any short term remedies necessary to meet this standard, as well as discuss how the corrective measures alternative(s) meet this standard.

2. Attain Media Cleanup Standards

   Remedies will be required to attain media cleanup standards. As part of the necessary information for satisfying this requirement, the Permittee shall address whether the potential remedy will achieve the remediation objectives. An estimate of the time frame necessary to achieve the goals shall be included. Contingent remedies may be proposed if there is doubt if the initial remedy will be successful (*e.g.*, contingent remedies to innovative technologies).

3. Control of Sources of Releases

   The Permittee shall address the issue of whether source control measures are necessary, and if so, the type of actions that would be appropriate. Any source control measure proposed should include a discussion on how well the method is anticipated to work given the particular situation at the facility and the known track record of the specific technology.

4. Comply With any Applicable Standards for Management of Wastes

   The Permittee shall include a discussion of how the specific waste management activities will be conducted in compliance with all applicable state and federal regulations (*e.g.*, closure requirements, LDRs)

5. Other Factors

There are five general factors that will be considered as appropriate by the EPA in selecting/approving a remedy that meets the four standards listed above. These five decision factors include:

a. Long-term reliability and effectiveness;
b. Reduction in the toxicity, mobility or volume of wastes;
c. Short-term effectiveness;
d. Implementability; and
e. Cost.

Examples of the type of information to include are provided below:

a. Long-term reliability and effectiveness: The Permittee may consider whether the technology, or combination of technologies, have been used effectively under analogous site conditions, whether failure of any one technology in the alternative would have any immediate impact on receptors, and whether the alternative would have the flexibility to deal with uncontrollable changes at the site. Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. In addition, each corrective measure alternative should be evaluated in terms of the projected useful life of the overall alternative and of its component technologies. Useful life is defined as the length of time the level of effectiveness can be maintained.

b. Reduction in the toxicity, mobility or volume of wastes: As a general goal, remedies will be preferred that employ techniques that are capable of eliminating or substantially reducing the potential for the wastes in SWMUs and/or contaminated media at the facility to cause future environmental releases. Estimates of how the corrective measure alternative will reduce toxicity, mobility and or volume of the waste is required and may be accomplished through a comparison of initial site conditions to expected post-corrective measures conditions.

c. Short-term effectiveness: The Permittee shall evaluate each corrective measure alternative for short-term effectiveness. Possible factors to consider are fire, explosion, exposure to hazardous constituents and potential threats associated with the treatment, excavation, transportation and re-disposal or containment of the waste material.

d. Implementability: Information to consider when assessing implementability include:

i. The administrative activities needed to implement the corrective measure alternative (*e.g.*, permits, rights of way, etc.) and the length of time these activities will take;
ii. The constructability, time for implementation, and time for beneficial results;
iii The availability of adequate off-site treatment, storage capacity, disposal services, needed technical services and materials; and
iv. The availability of prospective technologies for each corrective measure alternative.

e. Cost: The Permittee shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs. The capital costs shall include, but are not limited to, costs for: engineering, site preparation, construction, materials, labor, sampling/analysis, waste management/disposal, permitting, health and safety measures, etc. The operation and maintenance costs shall include labor, training, sampling and analysis, maintenance materials, utilities, waste disposal and/or treatment, etc. Costs shall be calculated as the net present value of the capital and operation and maintenance costs.

F. Justification and Recommendation of the Corrective Measure or Measures

The Permittee shall justify and recommend in the CMS a corrective measure alternative for consideration by the Agency. Such a recommendation should include a description and supporting rationale for the preferred alternative that is consistent with the corrective action standards and remedy selection decision factors discussed above. In addition, this recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Trade-offs among health risks, environmental effects, and other pertinent factors shall be highlighted. The Regional Administrator will select the corrective measure alternative or alternatives to be implemented based on the results presented in the CMS.

APPENDIX D: SCHEDULE OF COMPLIANCE

Schedule of Compliance	Due Date
Cost Estimate for Completion of Corrective Action *See Condition I.D.4.b.*	Within one hundred twenty (120) calendar days of the effective date of the Permit
Annual Cost Estimate Review Report *See Conditions I.D.4.c. and II.H.6.*	Annually
Financial Assurance for Completion of Corrective Action *See Condition I.D.5.b.*	Within sixty (60) calendar days after approval of cost estimate in Condition I.D.4.b.
Notification of Newly Identified SWMUs and AOCs *See Condition II.B.1. and Condition II.B.2.*	Within fifteen (15) calendar days of discovery
SWMU Assessment Report *See Condition II.B.3.*	Within ninety (90) calendar days of notification
Notification for Newly Discovered Releases at Previously Identified SWMUs and AOCs *See Condition II.C.1.*	Within fifteen (15) calendar days of discovery
Confirmatory Sampling Work Plan for SWMUs identified under Condition II.B.4. or AOCs identified under Condition II.B.1. *See Condition II.D.1.*	Within forty-five (45) calendar days of notification by the Regional Administrator (RA)
Confirmatory Sampling Report *See Condition II.D.4.*	In accordance with the approved CS Work Plan
RFI Work Plan for SWMU(s) and AOC(s) Identified under Condition II.B.4., Condition II.C.2., or Condition II.D.5. *See Condition II.E.1.a.*	Within ninety (90) calendar days after receipt of notification by the RA which SWMUs or AOCs require an RFI
Draft RFI Report *See Condition II.E.3.a.*	In accordance with the approved RFI Work Plan
Final RFI Report *See Condition II.E.3.a.*	Within thirty (30) calendar days after receipt of the RA's final comments on Draft RFI Report
RFI Progress Reports *See Condition II.E.3.d.*	Quarterly, beginning ninety (90) calendar days from the start date specified by the RA*

Interim Measures Work Plan *See Condition II.F.1.a.*	Within thirty (30) calendar days of notification by the RA
Interim Measures Progress Reports *See Condition II.F.3.a.*	In accordance with the approved Interim Measures Work Plan or semi-annually for Permittee initiated IM**
Interim Measures Report *See Condition II.F.3.b.*	Within ninety (90) calendar days of completion
CMS *See Condition II.G.3.*	Within ninety (90) calendar days of notification by the RA
Final CMS *See Condition II.G.4.*	As specified in writing by the RA
Cost Estimates and Demonstration of Financial Assurance for Final Remedy *See Condition II.H.6.*	Within one hundred twenty (120) calendar days after permit modification for remedy
Annual Remedy Implementation and Effectiveness Report *See Condition II.H.5.*	Annually
Noncompliance/Imminent Hazard Report *See Conditions I.D.16.a. and I.D.16.c.*	Oral within 24 hours and written within fifteen (15) calendar days of becoming aware of the hazardous circumstances
The above reports must be signed and certified in accordance with 40 CFR § 270.11. * This applies to Work Plan execution that requires more than one hundred eighty (180) calendar days ** This applies to Work Plan execution that requires more than one year.	

APPENDIX E: INSTITUTIONAL CONTROLS MATRIX

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
Governmental Controls	Controls using the regulatory authority of a government entity to impose restrictions on citizens or property under its jurisdiction. Generally, the EPA must turn to state or local governments to establish controls of this type. For example, a local jurisdiction may zone the site to disallow uses that are incompatible with the remedy.	Does not require the negotiation, drafting, or recording of parcel-by-parcel propriety controls. This is important with large numbers of distinct parcels, particularly where some of the landowners are not liable parties. The legal impediments (*e.g.*, "whether the control runs with the land"; whether the right to enforce the control can be transferred to other parties) to long term enforcement of proprietary controls can be avoided; governmental controls remain effective so long as they are not repealed and are enforced.	Will almost always have to be adopted and enforced by a governmental entity other than the EPA (*e.g.*, state or local governments). Thus, their effectiveness depends in most cases upon the willingness of state or local governments to adopt them, keep them in force, and enforce them over the long term. There may also be enforcement costs for the state or local jurisdiction.	Usually enforced by the state or local government. The willingness and capability of the state or local government to enforce the IC should be given due consideration.

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
1. Zoning	A common land use restriction specifying allowed land use for certain areas. Example: A local government could prohibit residential development in an area of contamination or limit gardening in certain areas.	Zoning can be used to prohibit activities that could disturb certain aspects of a remedy or to control certain exposures not otherwise protected under a remedy.	Zoning ordinances are not necessarily permanent; they can be repealed or local governments can grant exceptions after public hearings. Typical zoning classifications such as "industrial" and "commercial" may not be stringent enough for a remedial context. For example, many zoning ordinances allow land uses below a certain level of intensity (*e.g.*, allowing residential uses in industrial districts). In addition, existing "blanket" zoning districts may not provide appropriate restrictions for specific remedy considerations, and local authorities may be concerned about potential legal challenges for "spot zoning" when rezoning a single parcel or small group of parcels. Therefore, an amendment to, or creative application of, the zoning ordinance may be necessary.	Zoning laws may not be fully effective unless they are monitored and enforced over the long term and local governments may not have or be able to commit the resources necessary to such oversight.

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
2. Local Permits	Special permits outlining specific requirements before an activity can be authorized. Example: An ordinance requiring that anyone seeking a building permit in a particular area be notified of contamination.	Can take advantages of existing restrictions and apply them to site-specific situations.	Often permits are narrowly focused and the requirements can be modified over time.	Effectiveness of enforcement depends on the willingness and capability of the local governmental entity to monitor compliance and take enforcement action.
3. Other Police Power Ordinances	Controls placed on access or use of certain areas. Example: Placing bans on fishing and swimming in specified areas.	Can take advantage of existing restrictions and apply them to site-specific situations.	Bans on fishing or swimming may be communicated through posting of the ordinance. However, postings, by themselves, may not be effective in preventing incidental contact or consumption.	Effectiveness of enforcement depends on the willingness and ability of the local governmental entity to monitor compliance and take enforcement action.
4. Groundwater Use Restrictions	Restrictions directed at limiting or prohibiting certain uses of groundwater which may include limitations or prohibitions on well drilling. Example: Establishment of groundwater management zones or protection areas; capping or closing of wells.	Can take advantage of existing restrictions and apply them to site-specific situations.	Implementation of such restrictions are dependent on a state's groundwater ownership and use laws. Local or state expenditures may be necessary to compensate owners of condemned property.	Effectiveness of enforcement depends on the willingness and ability of the local governmental entity to monitor compliance and take enforcement action.

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
5. Condemnation of Property	Taking over title of a property by condemning it under a government entity's eminent domain authority. Example: Taking over title through condemnation to prevent the site from being used.	Used as a way to take title of a property to control land use or impose a desired land use for a specific purpose. Property may be condemned under federal, state, or local authority.	The owner of the property is entitled to compensation, may be recoverable under section 107 of CERCLA.	Not applicable.
Proprietary Controls	Tools based on private property law used to restrict or affect the use of property.	Can be implemented without the intervention of any federal, state, or local regulatory authority. Advisable when restrictions on activities are intended to be long-term or permanent (contaminants will be left in place that prevent unrestricted use).	Since property laws vary by state, always check whether or not there are court-recognized doctrines that would limit the extent to which the controls run with the land or are transferable to other parties.	To be enforceable in most courts, the instrument used for the conveyance of any property right should clearly state: • The nature and extent of the control to be imposed; • Whether the control will "run with the land" (*i.e.*, be binding on subsequent purchasers); • Whether the right to enforce the control can be transferred to other parties

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
1. Easements	A property right conveyed by a landowner to another party which gives the second party rights with regard to the first party's land. An "affirmative" easement allows the holder to enter upon or use another's property for a particular purpose. A "negative" easement imposes limits on how the landowner can use his or her own property. Examples: Affirmative easement – Access by a non-landowner to a property to conduct monitoring. Negative easement – prohibit well-drilling on the property by the landowner.	Most flexible and commonly used proprietary control. The EPA can hold an "in gross" easement since it generally will not own an adjacent parcel of land. An "appurtenant" easement can only be given to adjacent landowners. (Note: the site manager or Regional Counsel should check all applicable state property laws and should not consider "in gross" easements to be transferable.) Most useful in situations where a single parcel of land is involved and the current owner of the land is subject to regulation under CERCLA or RCRA.	For an easement to be created there must be a conveyance from one party to another. An easement cannot be established unless there is a party willing to hold the easement. This can present difficulties since the EPA cannot hold an easement under the NCP without compliance with all procedures required by section 104(j) of CERCLA. Furthermore, some state governments cannot hold easements, and other parties may be unwilling to do so. Since the owner may not be the only party with whom it is necessary to negotiate, a title search should be conducted to ensure that agreements have been obtained from all necessary parties (*e.g.*, holders of prior easements with right of access).	In general, an easement is fully enforceable as long as its nature and scope are clear and notice is properly given to the parties against whom the agreements are binding (*e.g.*, by recording the easement in land records). Use caution when determining who will hold the easement. Sometimes Potentially Responsible Parties (PRPs) acquire easements from other landowners thus taking on the burden of negotiating and paying for them. However, as a third party, the EPA may not have the right to enforce or transfer the easement unless that right is specified in the agreement between the PRP and other landowners. The terms of easements are enforceable by the holder in the state court with jurisdiction over the property's location.

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
2. Covenants	A covenant is an agreement between one landowner to another made in connection with a conveyance of property to use or refrain from using the property in a certain manner. Similar to easements but are subject to a somewhat different set of formal requirements. Example: A covenant not to dig on a certain portion of the property.	Can be used to establish an IC where the remediated property is being transferred from the current owner to another party.	The agree is binding on subsequent owners of the land if: (1) notice is given to the subsequent land owner, (2) there is a clear statement of intent to bind future owners, (3) the agreement "touches and concerns" the land, and (4) there is vertical and horizontal privity between the parties.[1]	Enforcement of covenants is subject to state law and enforceable by the holder in the state court with jurisdiction over the property's location.

[1] Horizontal privity means that only a contract party may claim relief for a breach of contract warranty or a condition. In other words, no person other than the buyer can sue for damages that arise out of the breach of contract warranty or condition. Vertical privity means that each party in a distribution chain only has a contract with the person ahead of him or her in the chain. For example, vertical privity would mean a consumer only has a remedy against the person from whom he or she purchased a particular item and could not sue the manufacturer.

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
3. Equitable Servitude	Closely related to covenants, equitable servitudes arose when courts of equity enforced agreements that did not meet all of the formal requirements of covenants.	Most likely to have value as an IC where a party responsible for cleanup expects to own neighboring property for a long period of time (as might be the case in partial military base closures).	The agreement is binding on subsequent owners of the land if: (1) notice is given to the subsequent land owner, (2) there is a clear statement of intent to bind future owners, and (3) the agreement "touches and concerns" the land. The third requirement should be met by any agreement that restricts what the owner can do with the land.	The ability to enforce an equitable servitude "in gross" against subsequent landowners is less likely to be recognized compared to easements and covenants, but this depends greatly on jurisdiction. The terms of equitable servitudes are enforceable by the holder in the state court with jurisdiction over the property's location.
4. Revisionary Interest	A revisionary interest is created when a landowner deeds property to another, but the deed specifies that the property will revert to the original owner under specified conditions. It places a condition on the transferee's right to own and occupy the land. If the condition is violated, the property is returned to the original owner or the owner's successors. Example: Failure to maintain the integrity of a cap.	Binding upon any subsequent purchasers. Most useful where it can be assumed that the original owner will be available over a long period to conduct further response determined to be necessary (*e.g.*, where a federal agency is selling the property).	Not useful if there is a chance that the original owner will not remain in existence for a long period of time.	Each owner in the chain of title must comply with conditions placed on the property. If a condition is violated, the property can revert to the original owner, even if there have been several transfers in the chain of title. The terms of revisionary interests are enforceable by the holder in the state court with jurisdiction over the property's location.

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
5. State Use Restrictions	State statutes providing owners of contaminated property with the authority to establish use restrictions specifically for contaminated property. For example: Connecticut property owners who wish to file an environmental use restriction must demonstrate that each person holding an interest in the land irrevocably subordinates their interest in the land to the environmental use restriction, and that the use restriction shall run with the land.[2]	Overrides common law impediments to allow for long term enforceability of real property interests.	In some cases, the authority to acquire or enforce the restriction is conferred only on the state. Therefore, the state's assistance is necessary to implement and enforce.	Determine whether the restriction can be federally enforced; if not, investigate whether the state is willing to take on the role of enforcement.
6. Conservation Easements	Statutes adopted by some states that establish easements to conserve and protect property and natural resources. Example: Open space or recreational space is maintained to prevent exposure or prevent uses that might degrade a landfill cap.	These statutes override common law technicalities and barriers that may pertain to traditional easements and covenants (*e.g.*, "in gross" easements are not upheld in some jurisdictions).	May only be used for a narrow range of possible purposes which could limit their usefulness as ICs.	In general, the holder must be a governmental body, a charitable corporation, association, or trust.

[2] CT General Statutes, 1997, Vol. 8, title 22a-133n through 22a-133s, contains the following provisions: "No owner of land may record an environmental use restriction on the land records of the municipality in which such land is located unless he simultaneously records documents which demonstrate that each person holding an interest…irrevocably subordinates such interest to the environmental use restriction. An environmental use restriction shall run with land, shall bind owner of the land and his successors and assigns, and shall be enforceable…"

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
Enforcement Tools (With IC Components)	Enforcement authority is used to either (1) prohibit a party form using land in certain ways or from carrying out certain activities at a specified property or (2) require a selling party to put in place some other form of control. This section addresses federal enforcement tools as opposed to those that may be available to state or local governments.	May be easier to establish than proprietary controls because the EPA is not dependent on 3rd parties to establish and enforce them.	Typically only binding on the original signatories of the agreement or binding only the party(ies) to whom it is issued in the case of a Unilateral Administrative Order. Negotiations and finalization of Administrative Orders on Consent (AOCs) and Consent Decrees (CDs) can be lengthy.	Enforcement by the EPA under CERCLA and RCRA or by a state if state enforcement tools are used.

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
1. Administrative Orders	An order directly restricting the use of property by a named party. An order also can be used to restrict the use of land owned by a non-liable party. This approach would be used if no other method (*e.g.*, proprietary control, governmental control) is successful (see limitations). Example: An order prohibiting the transfer of drums off site or dredging in a containment area.	The EPA has broad scope of authority to issue orders to protect public health and the environment (section 106 of CERCLA). Can be implemented without the execution of any further property instruments. Can include provisions requiring the property owner to disclose the order's existence to potential purchaser or lessee, and notify the EPA of any anticipated change in ownership, the identities of any potential purchasers or lessees. Does not require an agreement with the landowner (though consent orders are generally considered more desirable). Unilateral orders can be easily modified in the event that the control needs to be modified or withdrawn.	Does not bind subsequent owners or parties not named in the order (*e.g.*, lessees). However, depending upon the facts of the case, an environmental regulator may have the authority to issue a new order to the new owner. An order to restrict a non-liable party may result in a claim for compensation under section 106(b).	Enforcement is by the EPA (or state if issued under state authority). Creates the threat of potential penalties for violations as an incentive to properly maintain the control.

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
2. Consent Decrees (CD)	A CD is signed by a judge and documents the settlement of an enforcement case. Similar to an Administrative Order, it is used to specify restrictions on use of land by the settling party. Example: No well drilling on the property.	Can be used to require a settling party to: 1. file a separate instrument conveying a proprietary control such as an easement or covenant to the EPA or a third party; 2. notify succors-in-title of the CD, site, and any easements; 3. notify the EPA of any anticipated change in ownership and the name and address of the potential purchaser or lessee; and 4. can be used to require settling non-property owners (PRPs) to attempt to obtain easements from parties that own land contaminated by the PRP in order to restrict land or resource use.	CDs alone are not binding on subsequent owners and occupants.	Enforced by the EPA (or state if issued under state authority); failure to comply can result in penalties.[3]

[3] While the EPA may not be able to enter into CDs with federal agencies, states can.

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
Informational Devices	Tools, which often rely on property record systems, used to provide public information about risks from contamination.	May effectively discourage inappropriate land users from acquiring the property. Easier to implement than other controls because they do not require a conveyance to be negotiated.	Has little or no effect on a property owner's legal rights regarding the future use of the property. If not drafted well, informational devices may discourage appropriate development and uses of land.	Not legally enforceable.
1. Deed notices	Commonly refers to a non-enforceable, purely informational document filed in public land records that alerts anyone searching the records to important information about the property. Example: Notice may state that the property is located within a Superfund site, identify the kinds of contaminants present and the risks they create, or describe activities that could result in undesirable exposures to the contaminants left on site.	May discourage inappropriate land use. Easier to implement than easements because they do not require a conveyance to be negotiated. Use only as a means of alerting and informing the public about information related to a particular piece of property.	Because deed notices are not a traditional real estate interest, proper practice in using them is not well established. Investigate state law and local practice in advance to determine whether such a notice will be recorded, how it should be drafted, and who would be entitled to revoke it. Before filing a notice, obtain the property owner's consent to avoid the risk of claims for slander of title. If not written properly, the notice may discourage all development, including uses that would be appropriate for the site, by creating a perceived liability risk.	A deed notice is not an interest in real property, so recording a notice has little or no effect on a property owner's legal rights regarding the future use of the property (*i.e.*, they are non-enforceable).

Type of Institutional Control (IC)	Definition & Example	Benefits	Limitations	Enforcement
2. State registries of hazardous waste sites	Registries containing elements that can be used as ICs. Examples: Compilation of hazardous waste sites in the state; annual reports summarizing the status of each site on the registry; notice with the deed for sites on the registry that the site is contaminated; and the requirement that any person conveying title to property on the registry to disclose to all potential purchasers the fact that the property is on the registry.	With the cooperation of the state, registries can be useful with other measures as part of an overall remedy, especially in providing information to the public. Some laws provide that the use of the property on the registry cannot be substantially changed without state approval.	The procedure for listing and removing sites from registries is solely at the state's discretion.	Any requirements are only enforceable by the state.
3. Advisories	Warnings that provide notice to potential users of land, surface water or groundwater of some existing or impending risk associated with their use. Advisories are usually issued by public health agencies, either at the federal, state, or local level. Example: An advisory issued to owners of private wells in a particular area that contamination has been detected in the groundwater.	Can be useful with other measures as part of an overall remedy, especially in providing information to the public.	These types of warnings, by themselves, are not likely to prevent incidental contact or consumption. Advisories also have a very short useful life and must continually be enforced.	Advisories do not have any legal effect nor do they create any enforceable restrictions.